The Builder.

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Birmingham: Art, Health, Education.

WHILE the Social Science Association was in Birmingham a statue of James Watt was set up in the open space between the Town Hall and the Midland Institute; very awkwardly, by the way; for though it is probably in what would be the centre of the road if the Institute had a square corner like the Town Hall, it does not look to be so, because the Institute corner is largely rounded off to benefit the traffic. The result is that the statue, which is of Sicilian marble, 8 ft. 3 in. in height, and with its pedestal nearly 20 ft., looks as if it had been popped down temporarily, and was waiting for the carrier to take it away again. That we may get rid of all our objections at once, let us add that the Darley Dale stone pedestal is of the egg-box family, and very insignificant, the designer having been trammelled probably by want of room. Watt holds in his right hand a pair of compasses, his left rests on the model of a cylinder, and his mind rests too,—rest and calm, indeed, characterise the statue. The attitude is expressive; the face admirable. Birmingham may thank Mr. Alexander Munro for giving them the only good statue yet in their streets. There is a meritorious figure of the Prince Consort housed in the Midland Institute, but this has not yet found a site, or been subjected to the test of an open-air situation. If money and sufficient space can be found, it ought to have a proper canopy. The statue of Attwood in New-street is a poor thing. Close by it a handsome new Bank is approaching completion, — a large stone-fronted building of two lofty stories, the upper one Corinthian. It carries Barry-like chimney-shafts at the angles, and will have an entrance porch or portico with marble columns in New-street when finished. It promises to be a very dignified structure, and very creditable to the architect, Mr. Holmes. The ugly brick flank wall seems to show that another building will butt against it. This is to be regretted: a structure of this kind should stand clear, and be in keeping all around,—a complete building, in fact, and not a couple of fronts. We cannot give Mr. Holmes equal praise for the Masonic Hall he is erecting in the same street. It has a carved stone doorway, not yet finished, but the rest of the two fronts (the Hall, like the Bank, is at the corner of a street, running backward to a considerable extent) is cemented. The details are poor; an ugly sentry-box is stuck over the angle attic window as a turret, and the whole pile can scarcely escape being called vulgar. A range of shops in progress come very prominently into notice a little nearer the Town-hall. These call Mr. Plevins author; and are of red brick, with freestone dressings, in the mixed style, Italian and Gothic, we of these days know so well. The windows have segmental heads under pointed arches, and the whole is,—well, a trifle *bizarre*.

The Theatre Royal, here at hand, has been newly decorated, and looks very gay—rather too gay, indeed. The prevailing tint is a bright blue complemented with a light French pink, and gods and goddesses, nymphs, and Cupids are lavishly scattered about. The proscenium is most elaborately adorned both as to form and colour, and *per se* the whole has a certain degree of richness. But this strength of colour before the curtain is a mistake. The scene ought always to hold the prominent place, and when the note is struck so high in front to cap it becomes difficult. The form of the auditorium here is much flatter and shallower than is usual in English theatres, where the abominable long horse-shoe generally obtains; and the result in the Birmingham Theatre is that, so far as we could observe, every one seemed to be able to see and hear, though the house was densely crowded to enjoy Miss Bateman's "curse."

Over the way are the rooms of the Royal Birmingham Society of Artists, and the annual exhibition of modern works of art is now open. It is a very agreeable collection, and includes 647 paintings and drawings, and eight pieces of sculpture. Its principal features are, of course, known to London art-lovers,—"Herod's Birthday Feast," by Armitage; "The Sleep of Duncan," by Maclise; "Rent-day in the Wilderness," by Landseer; "The Tuileries," by Elmore (the best picture he ever painted); "Before Waterloo," by O'Neill, and some others. The committee, by the way, give a good sentence, by Lessing, on their catalogue:—

> "Art must paint as plastic nature conceived the picture; without the imperfection which resistent matter renders unavoidable, and without the injury which time works upon it."

Do the good people of Birmingham do as much for art as they should and might? Judging from what we saw and heard during a visit to the School of Art we are disposed to think not. The rooms are in the top floor of the Midland Institute, and it is no reproach to the architect when we say that they are not suitable to the purpose, and do not afford anything like accommodation enough. The gas having been burning for some time, the thermometer marked a temperature of 95°! The students were crowded together, and the classification was not what is desirable. At the present moment there are 750 students on the books, and there might be half as many more if the accommodation were sufficient and good. A large separate well-ventilated and well-lighted building should be provided, and the manufacturers should feel that it is their interest to support the school nobly. The town will reap a hundred-fold for all they sow in this soil. Let us also exhort the young that they avail themselves at once of such facilities as *are* afforded. The man who wants to learn will triumph over obstacles: will not give in because everything is not exactly as he would wish it. Industrial art offers ample scope for gaining fame as well as money. As Mr. Robert Fleury said the other day to students in Paris,—"Industrial art has the sympathy of all the world—the production of a potter of Athens finds passionate admirers everywhere. Any one may be proud to add his name to the long list of famous art-workmen. Believe me, industry offers a fine field for those who know how to distinguish themselves in it. Work, for labour is honourable; it renders men better, and therefore more capable of fulfilling all the duties of life. Develop your faculties by study, and raise industry to the level of art. Remember that the grand epochs which make the glory of nations are also those in which art and industry were at their apogee."

We felt it matter for regret that so little was said on the subject of art-industry during the recent Social Science Congress. One of the ladies, however, who so ably took part in the proceedings, made this observation (and it ought not to be quite overlooked in Birmingham), that for want of artistic training women in Paris are now being largely superseded by men in the distinctly feminine employments, such as millinery and the dressing of shop-windows. Through want of artistic training, how many English men are superseded by foreign men! The Congress, we regret to hear, has not been a success, in a pecuniary point of view, though in other respects greatly so. The president and heads of departments made very excellent addresses. The discussions were valuable and well sustained, and much good seed, it may be hoped, has been sown, and will bear fruit in due season; but the population of Birmingham did not flock in to take tickets as they should have done.

The Rev. Dr. Hart Burges, vicar of Bishop Ryder's, Birmingham, has addressed to us a letter, which will be found on another page, commenting on the remarks the conductor of this Journal found himself compelled to make, at the recent Social Science Congress, as to the lamentable state of certain parts of the town. The assertions were, that a large population was living in the heart of the town under conditions inconsistent not only with health but with virtue; that in these wretched districts not one child to whom he had spoken could read; that girls and boys were growing up in ignorance, dirt, and ill health, with no other prospects than the streets for the one and the gaol for the other; and he asked, looking at the state of the people as well as of the places, not alone whether the town authorities had used the remedial powers they possessed, but where had been the ministers of the Church,—where had been the clergy generally? The vicar takes no exception to the particulars given of the unwholesome dens in which masses of his people are living,—if the word may be allowed. On the contrary, he fully admits "the incalculable injury to health and physical well-being" that is thus done; and is fully satisfied "that the generally wretched character of the dwellings of the poor, the absence of refining influences, and the miserable associations of poverty-stricken homes, courts, and streets, tend much to the inhumanising influence which, destroying the finer susceptibilities and blunting the better feelings of the heart, generally results in brutality and crime, a family plague and a social curse." "In the greater portion of Mr. Godwin's statements," says Dr. Burges, "I most thoroughly agree;" but naturally enough he would remove from the ministers of the church any reflection that may seem to have been cast upon them by the inquiry; and this he seeks to do by stating that "the educational necessities of the parish have not been overlooked;" setting forth the number of schoolrooms in the parish, and adding, "so strong is my sense of the deep need of the portion of my parish alluded to by Mr. Godwin, that the erection of a large ragged and infant school will be commenced (D.V.) within ten days." This is good hearing; Dr. Burges's warm interest in the matter is even better; but does it in the slightest degree show the impropriety of the question? We think not. Schools or no schools, here is the fact that hundreds of children in certain districts are growing up in a state of the densest ignorance. The fact is not denied; cannot be denied. In the course of two examinations not a single child spoken to could read. "You need not trouble yourself to ask;" the intelligent police-officer who was with us on the first occasion remarked, "none of them are taught anything but bad; and yet, as

I have often said, this is in England, and we send out people to teach the blacks!" The reverend vicar's statement is no more an answer than is that of the mayor to the objections to the sanitary condition of these parts of the town. The mayor says the town has spent on its present sanitary system within the last twenty-five years no less a sum than 200,000*l.*, and the death-rate is low compared with that of other large towns. It would be satisfactory to know the items of this expenditure. But, supposing the money has been wisely used, the amount is but small comparatively; and if it were five times as much, it would be no excuse for a community allowing in their very midst thousands of their fellow-creatures to be horded together year after year under conditions which put cleanliness of mind or body out of their reach, and make health and virtue alike impossible. As to the general healthiness of the town, will the mayor tell us the death-rate in the summer months of these particular districts? Unless we are gravely misinformed, it would be found frightful. More than one medical resident have told us that in some of the places visited fever has not been absent for years. Are these things to remain unchanged, because less unhealthy parts of the town admit of an average death-rate being stated not immoderate, considered with reference to some other towns, but still very large as compared with really healthy places? As Dr. Farr said, after the Mayor had spoken, — "It is little consolation to persons living in unhealthy parts of the town to know that others residing not far off are enjoying the advantages of salubrity."

While dense masses of people in the midst of wealthy communities are found ignorant and untended, growing up wholly to the bad, and supplying unintermittingly the gaols and hospitals, the inquiry will still be made, "Where have been the ministers of the Church? where have been the clergy generally? If it be the system that is at fault, not the individuals, they can at least say so, and demand from each pulpit and platform such arrangements as will give to every fresh-born fellow-creature the chance of health and purity.

It will not be supposed that we are speaking of Birmingham as if it stood alone. Other large towns, and our readers know how many we have personally and painfully examined, present the same dreadful condition of things. The right remedy is not merely of local interest; it is an Imperial question of the greatest and gravest importance.

HAMPSTEAD FEVER-HOSPITAL COMPETITION.

The plans of six selected architects mentioned in our last are now before the Metropolis Asylum Board. A premium of 200*l.* is offered for the best design, 150*l.* for the second best, and the successful competitor if required is to carry out the works for a payment of 750*l.*, less the amount of premium: but he will not be entitled to any premium or payment unless a substantial contractor will undertake the work at a price not more than 10 *per cent.* above the architect's estimate, which is to be sent in with the plans. This seems to show that the Board contemplate an expenditure of some 15,000*l.*, as we can scarcely suppose that a metropolitan public body would take advantage of their position to assist in lowering the established remuneration of a not too highly-paid profession, especially as four out of the six competitors will get nothing for their labour in preparing designs. This proposed expenditure, however, would seem to be insufficient to supply what is wanted.

The instructions required,—That the building should be on the pavilion principle, with distance of 60 ft. between them, and provide for the accommodation of 104 patients; that no pavilion should have more than two stories; that the buildings should be so arranged as to admit of their future extension, and the ultimate addition of other pavilions; that the axes of the buildings should be north and south, if practicable, so that the windows on either side of the wards should face east and west; and that an adequate site should be left for the erection of a Small-pox Hospital.

The names of the competitors, and the sums at which they severally estimate the cost of carrying out their designs, stand thus,—

Messrs. Pennington & Bridgen	£15,500
Messrs. P. Gordon Smith & G. A. Dunnage	19,200
Mr. Saxon Snell	20,000
(For 208 bed., £27,000.)	
Mr. F. Fowler	£24,500
Amended to £20,500.	
Mr. Edmeston, No. 1	27,500
No. 2	28,000
Messrs. Beeston, Son, & Brereton	59,226

The reason why the last-named design should cost so much more in execution than the sums named by the other competitors is not obvious. The general arrangement is symmetrical, the material is red brick, and the style Jacobean. The sum stated, however, and the fact that the designers have not fulfilled the proper desire of the Board to place the pavilions north and south, will probably lead the Board to give little consideration to this design. As to the estimates generally, the Board ought to take it for granted that the sums named are simply "opinions." An actual estimate of any one of the designs would cost at least as much as the premium offered, and we suppose the Board do not desire that the sacrifice made by the competitors in their anxiety to get public business should go to that extent.

The section of the ground furnished by the Board shows a rise from east to west of no less than 58 ft., and this has increased the difficulties of the competitors. We may say at once that any attempt to make a long line of building follow this slope would produce a failure. The bad effect of this is shown in Mr. Edmeston's view of No. 1 design. His design No. 2 is much better, and deserves consideration. In this the isolation of all the pavilions by means of curved corridors leading from main corridor, so that the chance may be lessened of infectious atmosphere being generally disseminated about the corridors, is attempted.

Mr. Snell proposes to place the pavilions on different levels, and connect them by corridors sloped according to the natural inclination of the ground, but he does not show the effect of his arrangement in his drawings. The plans represent the building as extended for the reception of 208 patients, and rather mystify in consequence. According to his estimate, it seems that while a hospital with 104 beds costs at the rate of 192*l.* per bed, one for 208 patients costs only 139*l.* per bed. Mr. F. Fowler has evidently bestowed much pains on his design, and sends two arrangements, one of which shows a double corridor, with a view to separation. We should scarcely be disposed to recommend an arrangement by which all the pavilions are made to open into one long closed corridor, as shown in the design submitted by Messrs. Pennington & Bridgen. The closing in of the spaces between the pavilions by means of the projecting closet-buildings at the extremities, is also objectionable. They wisely urge the importance of confining hospitals for very infectious diseases to one story.

The greatest amount of airiness is proffered by Messrs. P. G. Smith & Dunnage, who give a number of distinct buildings placed widely apart and *en échelon*, so as, ingeniously, to free them one from another. The covered ways for administrative purposes are on an incline. They divide the difference in the levels at the administrative department in the centre, and so dispense with steps on the lower floor of all the pavilions on each side of it. Although the buildings are necessarily scattered, by terminating the octagonal closet-buildings which are placed on each side of the end of each block with a conical roof, the connexion of the whole is seen, and some architectural effect obtained. We are but glancing at the drawings superficially, and cannot say how other requirements are met; but certainly one great desideratum is supplied by this design.

Many things will have to be considered by the Board before erecting, and in the course of erecting, such an establishment as is proposed,—the home of small-pox, typhus, and scarlet fever. The disposal of the sewage, for example, will demand serious thought, or dire results may follow in the future. Indeed, a great responsibility rests on the committee who have this matter in hand, and we would strenuously urge them to call in a small mixed committee of architects and medical men who have given attention to the subject, to assist them not merely in selecting the best design from those submitted, but in rendering the design as free from objections as possible compatible with present knowledge. An additional 500*l.* thus used would show wise economy. The amount of good or evil that may be done by the intended hospital is enormous; and it cannot be too strongly impressed on each member of the Board that they have in hand a work that cannot be treated lightly,—a problem before them that cannot be rightly solved without the best knowledge and the deepest consideration.

THE VENGEANCE OF THE THAMES.

We wish to call the attention of those who are interested in the conservation of the public works of London, to one of those indications which it is well never to neglect. We do so neither as wishing to excite alarm, nor as speaking otherwise than hypothetically. Attention will not be thrown away if directed to the subject; and, if it prove that the warning is unnecessary, none will be more rejoiced than ourselves.

Many of our readers are familiar with the aspect of the quay wall of the Thames Embankment as seen from the river, as well as with the various picturesque scenes that open on the eye of the steam-boat passenger, or the pedestrian who passes along the hoarded causeway of the Embankment. The northern arch of Waterloo Bridge is entirely inclosed by the new roadway, and a pair of granite piers, designed in accordance with the architectural style of that noble structure, serve to unite the pier with the quay. The pier thus brought into line with the wall shows a serious crack, which, as far as we can ascertain, is entirely new. Supported as the work in which the defect occurs is, by the granite masonry on either side, this lateral movement is the more unexpected, not to say alarming. It is a subject to which a process of accurate investigation cannot be too speedily or too carefully directed.

The condition of the whole of the bed of the Thames, as far as it is affected by the tidal scour, has been interfered with by the works of the Embankment. How serious this interference has been, is a question which we should be glad to have elucidated. It is far from being a simple one; it is far from being unimportant. It is one on which we have at present a certain limited amount of information. It is essential to the maintenance of confidence in the Thames bridges that the subject should be thoroughly investigated and understood.

The level of the bed of the Thames may admit of considerable variation, without occasioning any apparent change on the surface of the river, except at very low water. The height of the high-water level depends on the state of the tides, on the winds prevailing, especially in the lower parts of the river, and in the obstacles offered, by bridges or other impediments, to the course of the flow. The effect of the combined ebb tide and current of the river will depend, not only on the actual quantity of water which is poured upwards through the arches of London Bridge by the flow, but also, to a great extent, on the form and character of the banks.

Now, the Thames Embankment, as it stands at present, has reduced the surface area of the river, above Blackfriars Bridge, by a very perceptible proportion. It may be urged that the scour of the downward current is diminished by the contraction of the area, as the water that would have risen over the shelving banks, now displaced by the embankment, is no longer sent there with the flow, to return with the ebb. But it must be remembered that the actual quantity of water thus displaced (if it can be proved to be kept below bridge by the change), is small in proportion to the surface area, as the shore in question was shallow and shelving. On the other hand, the bank of the stream on which the centrifugal, or rather tangential, force of the current and the ebb throws the most stress, is reduced in width; while the smooth, nearly vertical wall, affording much less frictional resistance to the stream than did the old irregular banks, is certain to produce a mining or burrowing action, of more or less intensity, during the ebb, and even, to some extent, during the flow.

Considerable obstruction to the flow is now occasioned by the enormous mass of piling that besets the site of Blackfriars Bridge. In so far as this tends to retard the incoming tide, this obstruction may be held to diminish the scour. But every other alteration which has taken place between the banks of the river, since the building of the new London Bridge, may be regarded as having a tendency to narrow and deepen the channel, and to increase the force of the scour. The iron cylinders which support the railway bridges have this effect, and the result of the change effected by the completion of the quay wall must be something very serious.

The important requisite is, to ascertain with scientific exactitude what are the actual facts of the case. We should be glad to know what observations have been made as to the effect of these works on the bed of the river. Sections

ought to be on record, taken from time to time, so that the scientific man may know clearly what action has already taken place, and thus may come to some satisfactory conclusion as to the future.

The whole question of the state of the Thames is of the utmost interest to the inhabitants of the metropolis.

As to a large portion of the sum expended in the improvement of the Thames, it is pretty clear that we have not heard the last word. It is not so very long since people began to put the question, how far it was wise, with a view to the purification of the river, to collect all the sewage of the metropolis, in order to pour it into the stream at a fixed point,—far enough, it might seem, below bridge, but still within the upcast flow of the tide. Strange and ugly stories were told of the evil that was being silently but swiftly effected at Barking Reach. They were contradicted even more loudly than they were uttered.

We should be glad to believe that the alarm was unfounded. Still the fact stares us in the face that an immense amount of fœcal matter is daily poured into the lower portion of the Thames, that the solid portions must be deposited somewhere, and that this deposit, if less serious an obstacle to navigation than an equal quantity of sand or gravel, is of a putrescent or putrescible quality. We must reserve the valuable elements of sewage manure for the purposes of agriculture, and allow nothing but water to return to our river channels, whether it be at Oxford, at Reading, or at Barking Creek, As to this there is but little room for doubt. If so, then our great metropolitan sewage works are but in a provisional and temporary state.

The past summer has afforded an unusual opportunity for gaining information, both as to the state of the bed of the Thames, and as to the minimum quantity of water that flows through the metropolis in a dry season. We should be glad to learn that advantage has been taken of the opportunity to secure this important information. The coming winter may enable us to make corresponding observations as to the maximum flow of the river; and in both cases the action of the scour on the bed of the stream should be accurately noted.

It is well known that the rebuilding of London Bridge had a distinct and appreciable effect on the tidal flow, and that the result of the change has been the deepening, in some places, of the bed of the river, the undermining of Westminster and Blackfriars Bridges, and the final destruction and removal of those structures. The Thames is no longer the noble stream, of which the salmon fishery was granted by the Prince of the Apostles to the mitred Abbots of Westminster, but it is still a river of sufficient volume and velocity to take its own way, which is pretty much the wont of all rivers that are not very tenderly and very skilfully dealt with. The bridges of Rennie have long been the pride of the profession of the Civil engineer, not only for the architectural merit of their elevations, for the boldness of their spans, and for the convenience of their level or easy roadways, but also for the soundness of their foundations, and for the unshaken homogeneity of every part. A crack in a pier of Waterloo Bridge is not, therefore, an unimportant affair. It is a fact which would have caused the builder to shake his head. It can arise from but one cause, namely, an undermining, more or less dangerous, of the foundation. The evidence of such an action at the very edge of the new quay wall, is a circumstance that should call attention to the state of all river foundations,—in fact, of the entire bed of the stream. It is not beyond the bounds of possibility that the question may be raised as to throwing an invert under portions of the Thames.

We desire to speak with all the reserve that becomes public writing. We wish to raise no sensation, to excite no undue alarm. But we cannot refrain from calling attention to an indication, slight as it may be, that the Thames is following the wonted habit of great rivers, when their course is in any way interfered with. They are accustomed to help themselves to an equivalent for that which is taken from them. Narrow their channel, and they will themselves deepen their bed. Such is the very first postulate of hydraulic engineering. Since the ancient bridge that, laden with houses, and upborne on piers that must have occupied more than a fourth of the waterway, kept back the flow of the tide from the shores of the Strand and of Lambeth, has been replaced by the present noble structure, we know that Thames *has* deepened his bed. More water comes up with the flow, now that the incoming tide is no longer strangled by piers and starlings. More water has to sweep down with the ebb; and in deepening its channel the river has already caused the removal of two bridges. In presence of this known activity of the stream, we have greatly contracted its width, and given it a quay-wall along which the tide and current may rush with the least possible littoral friction. That the result would become apparent *somewhere*, on the bed of the river, any engineer might have foretold. What and where that result will be, is the question that it is now important to solve.

We are not speaking from hearsay or from gossip, but from actual observation. Two gentlemen long familiar with the locality, one an engineer and the other an architect, observed the black gaps in the courses of the pier, in which the ebbing tide left a slimy deposit only a day or two since. "Do you observe that mark?" said one. "I was just looking at it," said the other. "I never saw it before: did you?" "It seems quite new," was the reply. "It must have appeared since we passed under the bridge a month or two ago. It is impossible we could have overlooked it." "It must be a settlement," said the engineer. "It is only the other day that attention was called to the fact of the perfect freedom of Rennie's bridges from cracks or settlement. The apparent support given to the pier by the granite masonry of the quay-wall on either side, makes the movement that has taken place more conspicuous." The steamer went on with a rush, and turned out its passengers to change boats,—a proceeding which the steam-boat managers seem to have adopted in the direct interest of the railway and omnibus companies. It is not any very precise information that can be gleaned on such a transient glance; but the indication, however slight, is positive.

We cannot, therefore, hesitate to form the opinion that it has become a matter of importance to ascertain the nature of the change which has taken place, and is taking place, in the channel of the Thames, in consequence of the recent structural modifications of its course. It must be borne in mind that when the thousand and one piles, and props, and struts that make the site of Blackfriars Bridge look like an immense workshop, erected in and over the river, are removed (which we hope will be the case before the close of the present century), the self-adjusting action of the river is likely to be intensified. At very low tides, years ago, it was apparent that two or three channels towards the centre of the stream took the main scour. Where that scour now lies,—whether in the old channel or alongside of the quay-wall, it is essential to ascertain. Great depth of piling appears to have been employed for the foundation of the embankment wall itself; but then it must be remembered that the foundation of Waterloo Bridge has long been considered *à l'abris* of any possible action on the bed of the river. If a pier of this structure is now on the move, the whole system of our river foundations must require reconsideration.

Nor is the question confined to bridges and quay walls alone. St. Paul's is said to be built on the gravel, and its foundations are on a level considerably above that of the Thames. In all cases where a drain or outlet is cut lower, the filtration and drainage from a pervious bed, if such a stratum is passed through, has a tendency to produce surface movement. The finer particles are gradually washed away by the action of the deepened outlet; the coarser follow, and subsidence may eventually succeed. It may seem, for the moment, wild, to speak of a possible movement in the dome of St. Paul's Cathedral as a sequel to a trifling displacement in a pier of Waterloo Bridge. We rejoice to believe that such a probability is, to say the least, extremely remote. But we are speaking not of inference or of opinion, but of the action of known mechanical law. The burrowing power of water respects no architectural beauties. This action, in the case of the Thames, has taken place, is taking place, and ought to be prevented; but precaution must be taken in time.

There can be no doubt that the action of the river is, at the present moment, perfectly within the control of the engineer. But to be so controlled, it must be foreseen and provided for. If we allow one engineer to build a bridge, another to raise a wall, and another to plant the water-way with a forest of timber,—in short, if we allow each man to do what in itself may be well advised, but what, as part of the *ensemble* may prove formidable, the Thames will give us trouble. It is only by an exhaustive method of dealing with all the requirements of this portion of our river system, that our results will be either satisfactory or permanent. On such considerations it will depend, whether the Thames shall prove the greatest ornament and advantage of that picturesque line of buildings, almost daily increasing in beauty, which stretches from the Cathedral Church of St. Paul to the Abbey Churchof St. Peter; or whether, neglected and ill-treated, the angry river shall prove the most relentless foe to the architectural excellence of London. It will be an evil day for the metropolis if we provoke the vengeance of the Thames.

ART-NOTES IN MANCHESTER.

The New Exchange in Manchester has not yet risen above the ground; the only indications of its progress at present consisting in the large deposits of brick walling which form the basement. The site of the other great building in contemplation, the Town Hall, is cleared of houses, and exhibits at present a waste of land varied with heaps of *débris*. A definite commencement, in the shape of laying a foundation-stone, will be made before long. Some of the first competitors who may not have seen the site would, perhaps, be surprised, could they see the narrow and mean-looking street (Princess-street) towards which they proposed to erect such splendid and ornate flank elevations. As the land is at present, the front towards Albert-square will be the only one that will be properly seen from a sufficient distance to take in the general effect of the design. The two large buildings being in this initial state, we are free to turn our attention to what architectural developments we may find, on a smaller scale, scattered up and down the streets of Manchester.

These are not at present very numerous, nor on the whole of very much interest, though there are two or three which are worth a pause to look at. Of these the most important, and one of the largest, is the new warehouse in Portland-street, now in course of erection from the designs of Mr. Waterhouse. This is one of those large buildings, almost peculiar to Manchester, which the necessity for the storage of valuable goods in great quantities has called into existence. It is in a round-arched Gothic style, the doors and windows on the ground story forming a series of semicircular-headed openings, with flat soffits having a bold roll-moulding at the angle, stopping on a square impost supported by a shaft; the actual window-opening being formed by an inner recessed jamb, with a second roll-moulding continued down to the sill without any break. When the imposts, now in the rough, are carved, this ground-story will present a very good effect of combined richness and solidity, quite in keeping with the object of the building; though, owing to the fact that the crown and springing of the arches have been kept at the same height throughout, while the openings are of varying width, the narrower arches are necessarily stilted to a degree not at all agreeable to the eye. Above this the majority of the openings are of that square-headed form, with angle-shafts on the chamfer-plane of the jamb, which Mr. Waterhouse is so fond of using, and which is indeed to be found in nearly all his latter designs. At each end of the front is a projecting angle bay, carried on a heavy stone corbel. Except at the back, the building is entirely faced with ashlar work of, apparently, a Yorkshire stone; a rusticated basement being formed of stone of a greyer tint; and internally the whole bearing of the floors will be on a system of cast-iron beams and columns; but what is to be the construction of the floors themselves does not yet appear. So far as the building has progressed (it is up to the level of third floor) it is a design very well adapted to its purpose; solid and durable, and not incongruously overlaid with ornament. Are the small panels over first-floor windows to be carved in the centre? At present they have a rather hard and bald appearance. A little way off, in the same street, is another still larger block of building, recently finished, of brick with stone dressings, which we shall perhaps not be wrong in ascribing to Mr. Salomons, partly because it resembles nothing else, and this gentleman seems to go in for a new style in every building he erects. There is an angle porch, internally circular on plan, flanked at the entrance by octagonal columns of

a most indescribable design, with very novel and not ineffective capitals, but too much bedizened with ornament about the base. The general design may be described as clever, but wanting in breadth of general effect and in refinement of detail,—too much cut up into little bits, and too full of conceits and oddities; in these qualities contrasting unfavourably with Mr. Waterhouse's simple and unobtrusive building just mentioned. The bands of incised stone ornament over first-floor windows are very pretty and effective, in that flat style which Mr. J. K. Colling has set the example of. Opposite this large building is a small "front," just finished, of detestable design, with stone piers between the windows of about the tenuity that would befit a design in cast-iron. Possibly they are strengthened by iron in the rear; if not, the stability of the structure is doubtful.

Opposite the Free Trade Hall is a large square block of Classicality just completed, with a ground story of rusticated masonry, forming a series of circular-headed openings, which has a solid, sensible look enough, but would have been better with a deeper reveal, to give more look of weight and strength, considering the size of the superstructure. Above the first-floor string there is nothing to praise. There are three stories of windows of the most common and conventional Classic type, a string course of the same section (and a very weak and ineffective section) forming a continuous sill to each range of windows, though the design of these latter is different in each story. The neglect of the point and expression which may be given to a building by a judicious contrast in the size and profile of the string-courses speaks only too surely of the absence of true feeling for architectural design. If Messrs. Grey & Knowles, to whom persons wishing to rent these offices are referred, were the architects thereof, we cannot congratulate them. Close to this is another block, of brick with stone dressings, less pretentious and a little more architectural in the treatment of the windows, but still very commonplace. As a curious contrast to these we may mention the large block of shops and offices just completed in John Dalton-street, for the perpetration of which, we believe, Messrs. Spekeman & Charlesworth must be answerable. Many of the Manchester architects seem to know no medium between dry Classicality and the wildest vagaries of Gothic out-Gothicised. We are always glad to see attempts to do something with brick in an artistic manner; but it is quite another thing to see a building covered over with large panels in recessed and projecting brickwork; and, as in the second story of this building, a ragged mass of double-recessed brick arches over the windows, the outer arch segmental, the inner circular, all springing from a stone shaft of disproportionate lightness. The application of panelling to the main piers of brick, which run up nearly the whole height of the building between the groups of windows, is most unhappy, since it gives an appearance of lightness and weakness to the very part which is constructively most important, and which ought consequently to appear heaviest; but as one of these main piers comes right over the crown of the semicircular-arched doorway, it may be as well that it has been made to look a little less crushing than it otherwise would have done.

There is also an angle doorway, with two shafts supporting immense chimney-looking corbels projecting towards each other at right angles, the under side of each forming a segment of a circle; while above they support an oblique lintel, forming the head of the entrance. The under side of each corbel is covered with a sort of pie-crust foliage, quite out of place in a situation where every line ought to indicate strength and bearing capability; in short, taken as a whole, this doorway is one of the worst architectural features we have seen for a long time. There is a small shop, however, erecting in Princess street, for Messrs. Palmer & Howe, which within a small space is even more extravagant than the last-named building, and may be called Manchester Gothic run mad. The whole principle of architectural design is inverted here; there is a very heavy corbelled brick cornice at the top; then thin brick pilasters, carrying pointed arches run through two stories, and resting upon a mass of horizontal stonework at the level of the first floor, under which a sham stone corbel and short shaft, supporting nothing, lead the eye down to a thin spiral shaft, forming the outer edge of an iron standard, which shaft, so far as the *design* is concerned, carries the whole superstructure of stone and brick. Of course, it is common enough to see a shop-front standing upon nothing apparently but plate-glass, and bad enough it is; but here the matter is made worse by the jugglery of the apparent corbel-shaft brought down upon the iron one, to cheat one into the belief that the support is in front and visible—a sort of prevarication, which is worse than the downright lie of the plate-glass. Of a very different class to the two last is the building in Cross-street, called Commercial Chambers, and which contains the new Stock Exchange. This is carried on solid piers from the ground; the ground-story pier being made, we suppose, as wide as the demands for shop-light will allow them to be, but not as wide as they ought to be to give the proper stability of appearance to the design. The building is in a round-arched style, the leading lines horizontal, and some details, as the archivolt mouldings of the windows, partaking of the Classic type, while the carving of the caps, and the proportion of shafts and caps to each other, are decidedly of Gothic character. On the whole, the elevation is a very successful specimen of general Classic form, or, we should prefer to say, horizontal form, with details of that boldness and depth of shadow which characterise the best Gothic work. The front is in two differently-coloured stones, harmonizing very well now while they are new, but we should fear not sufficiently strong in contrast to retain their effect for long in smoky and rainy Manchester. One defect in the design is that the doorway is badly placed, not being centrally under any other feature; and a pier on the first floor comes just over the haunch of the arch, which, of course, is bad both constructively and artistically. But this is the only positive fault we should find with the building. Internally, there is a good and well-lighted staircase; and, as a whole, this building is a credit to its architect, whose name we did not learn.

To turn from one art to another, we must confess that the Manchester Picture Exhibition this year, though a large one numerically, is not in point of quality so good as might be; not so good certainly as one or two that we have chanced to see there before. There seems to be a pretty large proportion of paintings by local artists, some of no small merit, and two or three of the best pictures from the Royal Academy we noticed during a hasty survey. Following "the line" round the room, it would be difficult to conjecture upon what principle pictures have been selected for the post of honour, save on that of giving an equal representation to all schools and styles.

Before quitting our subject, we are tempted to ask, when do the good folk of Manchester mean to do anything to render their principal and busiest thoroughfare, Market-street, less architecturally uninteresting? Half the rebuilding seems to go on in back streets; and here in the main street of the city is all the ugliness of the most debased period of jerry building. There will be the New Exchange presently, certainly, but can no enterprising person start a better and more artistic class of buildings for shops in that locality? But let it be noted that when we say "artistic," we do not include under that term any of those firework designs in brick for which some Manchester architects have shown such a predilection; more particularly do we denounce these when they come out in parti-coloured brickwork, giving the idea of having been copied from Manchester coloured prints. Whenever any part of Market-street may be rebuilt, let those who do it choose a sober, well-considered, architectural style of treating the buildings, as they value their commercial prosperity; for a whole street built of shops, like the one we mentioned in Princess-street, would be enough to frighten away all "buyers" from the city of cotton and calicoes.

Portslade-by-Sea, Brighton.—A deputation of the members of the late Brighton Mechanics' Institution, with their secretary, attended, by invitation of Mr. Henry Scrase, one of their former colleagues, at the recent opening of an assembly-room, which that gentleman has built at Portslade-by-Sea, for the purpose of holding meetings, lectures, concerts, readings, and for religious worship, as well as for the establishment of a reading-room and library for the inhabitants of that thriving suburb.

AT THE SOCIAL SCIENCE CONGRESS.

As president of the Health Section, Dr. Rumsey delivered, during the recent meeting in Birmingham, an able address. We print one portion of it touching

The Air of Towns.

Although much has been learnt from the study of death-rates, I have for some time past scrupled to quote them in support of sanitary *dicta*. With all respect for the Registrar-General, and for my learned and distinguished friend, Dr. Farr, I find these statistics full of fallacies, especially in crowded towns, where the figures give by far too favourable an estimate of that mortality which is strictly due to town life. I need hardly say that the death-roll does not reveal the actual loss of health among town masses, nor does it record the multitudes disabled by a host of diseases and casualties which may not at once destroy life, though they ravage the territory of labour and duty, and levy a heavy tribute upon produce and property. For this we need an official registration of sickness attended at the public cost. Professor Haughton has shown that, on very simple mathematical principles, the density of a population would be a factor determining the ascent of the curve of increase of an epidemic. This would apply to the case of the distribution of poison by a water company. "I believe," adds Dr. Morris, in his very remarkable essay on germinal matter, "that bad sanitary state of any kind would be equivalent to greater proximity." All other sanitary appliances and reforms being equally adopted or equally neglected, it is certain that close proximity of dwellings over an extensive area is *per se* a cause of unhealthiness and deterioration of race. It is not fair to compare a well-regulated town population, having, perhaps, only eight square yards for each person to live upon, with an ill-conditioned dirty population in the open country. For all this vitiation of air caused by town life there appear to be three natural remedies of different values in different cases,—motion of air, diffusion of gases by natural law, the presence or introduction of active oxygen. Now (1) the mere motion of air, if it be natural motion, *i. e.* wind, is occasional and *variable*, while the generation of morbific causes is *constant*, the remedy cannot be relied on, for the air is often stagnant in circumstances of the greatest danger. The motion of air in towns is impeded by the proximity and height of buildings probably as much as by insufficient openings in rooms. Nor do we know that, without the admixture of pure air, foul air can purify itself by simple motion. If the motion be artificial, it may be excessive or ill-timed, but of this again. 2. The diffusion of gases is necessarily limited by space, and mainly by superficial space; for of their diffusion in a vertical direction, *i. e.*, into the upper regions of the atmosphere, we know little, and that little (depending partly on diminution of temperature according to height of aërial column, and partly on the relative specific gravity of gases) does not favour the hypothesis of an effectual change. Gaseous diffusion is also impeded by the very circumstances which impede aërial motion. And these circumstances are most potential in towns. 3. But the presence of active oxygen in sufficient quantity—and sufficiency here means abundance—were that possible in dense populations, would be the real remedy. Oxygen I take to be the burning and purifying principle of nature, represented by the elemental fire of the ancients. For flame is but luminous combustion. Professor Tyndall has shown by his curious candle-burning experiments in the Vale of Chamounix and on the summit of Mont Blanc, that the quickness and intensity of combustion, such as takes place in vigorous oxydation, is, in general, incompatible with that brightness of flame which depends on the presence of carbon or other inflammable matter. The purer the air, the more invisible is the fire, yet the more effectual the burning. The proportion, chemically determined, of oxygen in air may not be much altered in towns, though it is sometimes found to be less; but recent discoveries tend to prove that its energy depends on the conversion of a portion of itself into another form, which, when obtained artificially, we call ozone. Since the most delicate tests fail to detect anything like ozone in the air of our crowded towns, we infer that in these places our great benefactor is "used up;" and that without his presence and aid, oxygen itself fails to purify. Practically, then, the most essential measure of sanitary legislation and ad-

ministration would be, not merely to purify as far as possible the air of towns, but also to provide better air than towns supply to the people. These objects may be accomplished by three methods:—(1) speedily removing all the *débris* of animal life, and everything which by decomposition can corrupt the air; (2) promoting the free circulation of air into every quarter, through every court and alley, into every house, every room, in the inhabited area,—in a word, ventilation; (3) enabling every person to breathe a sufficient quantity of good air, *i.e.* air having the properties of ozone. Our sanitary laws, if properly carried into effect, which they are not at present, may secure the first object. The second is a very vexed question. What is sufficient ventilation; and how is it to be obtained? The verdict in each case must depend on circumstances which in different cases are most diverse and complicated; for, on the particular temperature of the climate, the season, the house, the workshop, the chamber, depends the demand for the more or less rapid circulation of air. In winter, or at night (exhalations being more readily condensed in cold air), several persons might remain not seriously injured in a room, the atmosphere of which would be dangerously vitiated by one person in a hot summer, or within the tropics, when and where the exhaled organic matter is volatilized and thus prepared for quick readmission into the living body. The question of temperature is so intimately connected with that of air-circulation, that a long and complete series of scientific observations, in a great variety of places, would seem to be necessary to frame even elementary formulæ of ventilation. If old-fashioned people are more anxious to warm their houses and rooms than to secure purity of air, advanced sanitarians are, perhaps, sometimes too eager to ventilate without sufficient attention to warmth. Both extremes may be avoided. An authorised allowance of cubic space might be insufficient for healthy existence without the introduction of currents of air so swift as to injure the weaker inmates of the house. Women, children, and the sick especially, would then be the chief sufferers. But, in crowded cities, the free circulation of pure air is simply impossible. The air outside the house—*i.e.* the air to be admitted for ventilation—is often, as we have seen, only a few degrees less vitiated than the air to be expelled. The air which sustains the life of 200 or 300 persons on every acre of a large district (including, for instance, more than a square mile), can never act properly upon effete organic matters; while invading currents of air from the open suburbs very rapidly lose their power to oxydise. Existing legal provisions against overcrowding in single houses and rooms—good as they are, and better as they might be—only touch the surface of this tremendous question.

Masters and Men.

Mr. A. J. Mundella read a paper, in which he traced the history of labour in this country to the period when masters and workmen were free to combine for their own benefit, and wages became a matter of bargain and sale between them. He then referred to trades' unions, which, he said, numbered no less than 700,000 members, who, with their families, represented about 3,500,000 of the industrial classes. The objects of these unions was to adjust the rates of wages, to aid members when out of work or in sickness, and to help in burying the dead, and they must exercise great influence upon society for good or for evil. The question now was, were they a blessing or a curse? He thought that, notwithstanding many faults, they had proved beneficial both to the working classes and the nation. There could not be the slightest doubt that the condition of the mechanics, who formed the staple of the members of the unions, was infinitely better than that of agricultural labourers. It was not to legislation, but to the good sense and good feeling of employers and workmen, that they must look for an effectual remedy for strikes. He had no faith in any arbitration by persons who were unacquainted with and not interested in the trade in which the dispute arose. Arbitration, to be effe ual, must be the result of a system of open and friendly bargain between masters and men i. eeting together, and talking over their common affairs in an amicable manner. Mr. Mundella gave an interesting sketch of the Board of Arbitration and Conciliation of the hosiery and glove trade at Nottingham, which consisted of n equal number of manufacturers and operatives, and, with its branches, governed 140,000 persons. He showed that the board had always been successful in settling disputes and preventing strikes, and said that the result of his experience, as president for eight years, was the conviction that nothing could be more conducive to the benefit of any trade, or to the growth of a kindly feeling between all engaged in it, as the existence of such a representative and legislative body.

Mr. W. Gilliver, on behalf of the Birmingham trades council, composed entirely of working men, read a paper on the same subject. He said there was often a difficulty in getting employers to discuss, with the representatives of a union, a trade dispute in a friendly way, and he suggested the appointment of a board or council of conciliation, composed of an equal number of members of the chamber of commerce and the trades' council in a town.

Mr. Kettle gave an account of the court of arbitration at Wolverhampton, which had succeeded in putting a stop to disputes and strikes in the building trades in that town, and the principles of which had been adopted by the same trades in Manchester and Salford. The difference between the Nottingham board and this court was that the awards of the latter could be legally enforced, the workmen agreeing to work upon the terms adopted. It was a matter for discussion whether that plan was the best, or whether the Court of Arbitration should rely solely upon the influence of public feeling for the carrying out of its judgments.

Mr. Samuel Morley, as a manufacturer, gave his entire adhesion to the Nottingham system, which he said had been a great success, and presented a solution of one of the most important questions of the day. That system was entirely a voluntary one, and he thought that if the law or force of any kind were introduced, it would collapse. He admitted the perfect right of working men to combine for the purpose of getting the highest price for their labour, but he denied their right to coerce their fellow-labourers, and trusted the Legislature would take most determined measures to punish such tyranny.

Mr. Alfred Hill, chairman of the Birmingham Chamber of Commerce, said that in the case of the Birmingham stonemasons an attempt last summer at conciliation had failed. The men objected to piecework, to the subletting of contracts, to wrought stone being brought into the town (they wanted the stone to be brought in a rough state from the quarry), and to arbitration. A committee, composed of three members of the Chamber of Commerce, three members of the trades' council, three operative masons, and three master builders, was appointed to settle the dispute; but after meeting three or four times they separated without coming to an agreement.

Mr. Jesse Collings read a paper

On "The State of Education in Birmingham."

He said the Birmingham Education Society,—originated by Mr. George Dixon, M.P., in March, 1867,—had ascertained the educational condition of the manual labour and the poorer classes in Birmingham with an exactitude which had not been equalled in any other town in England. House-to-house visits were made in 754 streets out of the 1,027 in the town. The remaining 273 streets were of a class that did not require visiting. The total number of children visited was 52,573. Of these 7,517 were under three years of age. Of the remaining 45,056, those who had been at school at some period of their lives numbered 32,997, and 12,059 had never been to school. This was stating the case in the most favourable light possible, because the number of children which had been at school included those which had attended for any space of time, however short, and to any school, including dame schools. The average time of each child at school was consequently very short, and altogether useless for the purpose of education, being for boys a year and three-quarters, and for girls two years and a quarter each. The actual number of children at school at the time of the inquiry was,—boys, 8,587; girls, 8,436; total, 17,023; or a little less than two-fifths of the whole number of children over three years of age. The educational state of the 45,056 children was as follows:—13,380 could read and write; 5,482 could read only, leaving 26,194, or more than one-half, who could neither read nor write. This was stating the case far too favourably; because a large number of those who were said to be able to read and write did so in such an imperfect manner that the acquirement would be of little or no practical value to them in after life. Many children between the ages of nine and fifteen, who were stated to be able to read and write well, were found on examination hardly able to write an easy paragraph in legible hand, or to read the same without spelling several words. Of the children actually at school, by far the larger portion were very young. Of the whole number, 10,890 were between the ages of three and nine, while only 6,128 were between the ages of nine and fifteen. There were 1,136 between three and four. The largest number (2,220) were between seven and eight, after which age they gradually fell off, till between eleven and twelve there were only 1,148, and between twelve and thirteen only 715. These tables showed at what a very early age the children left school. It would be a mistake to suppose that the children not at school were at work, because as a matter of fact only 6,337 were at work, thus showing to a certainty that 21,696 children out of 45,056, between the ages of three and fifteen, were neither at school nor at work. Of the 6,337 children who were at work, 2,044, or not 35 per cent., could read and write, while 926, or about 16 per cent., had never been inside a school. These tables indicated so clearly a lamentably low state of education among the grown-up persons of the working classes, that the committee resolved to test, by individual examination, the state of education of the young persons between thirteen and twenty-one, employed in the various factories in the town. The test used was the Fourth Standard of the Committee of Council on Education, which consists of reading an easy paragraph, writing the same, and doing the simplest sum in arithmetic, in which money was used. This standard was so low that its attainment was scarcely worthy the name of instruction; yet only 41 out of 908 young persons, or about 4½ per cent., could pass. Many of these young persons had been to school a considerable time; nearly half of them for a period of more than three years. The total amount of school accommodation in Birmingham (excluding private schools and the Free Grammar School) was for 29,275 children. The average attendance was 18,531, leaving vacancies for 10,742. The whole accommodation, even if properly distributed, would leave 15,781 children unprovided for. But it was very unequally distributed, varying from one in seven of the population in St. Mary's Ward to one in twenty-eight in St. Paul's. Duddleston, for example, containing about 48,000 inhabitants, had only school accommodation for about one in seventeen of the population. There were in Birmingham sixty-three schools under Government inspection and receiving Government grants, with an average attendance of 15,276 children. The children's school fees amounted at these schools to 7,035*l.* 15*s.*; subscriptions came to 2,868*l.*, and the Government grants amounted to 6,144*l.* 12*s.*; total, 16,048*l.* 17*s.* There were twenty-seven schools not receiving Government grants. The children's fees in these cases amounted to 743*l.* 2*s.*; subscriptions at least, 632*l.*; total, 1,375*l.* 2*s.* The number of children on the books of night schools in November last was 2,679; but the average attendance was only 1,640. Fees in night schools, 307*l.* 17*s.*; subscriptions, 90*l.* 12*s.*; Government grants, 210*l.* 17*s.*; total, 608*l.* 16*s.* Total from all sources spent on the schools in Birmingham, 18,033*l.* The Free Grammar School had very little influence in the education of the poorer classes in Birmingham. The New-street school had been used principally by the children of the middle and upper classes, and even the elementary schools belonging to the charity had been for the most part filled with the children of small tradesmen, foremen, and the better class of artisans. Those who had most need, the poor children, who could not, through poverty, be sent to school, had not any share in that wealthy institution, the Free Grammar School. A study of the evidence given before the Royal Commissioners led to the conclusion that education in Birmingham would have been as good if the Grammar School had never existed. Mr. J. S. Wright said, in his evidence, that "the effect of this school has been to destroy nearly all the private schools in Birmingham. My own feeling is that if there had been no charity of this kind the people of Birmingham would not have been worse educated." The head-master himself said:—"The system of admission by nomination, and that of gratuitous education, have been most injurious to the cause of education in the town.

I believe that together they have acted as a positive blight upon the preliminary education of the children of nearly 300,000 people." Nearly all the children in the school belonged to parents who were able and would be willing, in the absence of the Free Grammar School, to pay for the education of their children; and these parents, waiting year after year for a nomination to the Free School, too often neglected the education of their children. Mr. Collings considered that there was little hope of education advancing satisfactorily under the present system. He advocated an unsectarian system, with compulsory attendance, and under local management and Government inspection.

Dwellings of the Labouring Poor in Birmingham.

The Rev. Micaiah Hill read a paper on this subject. He said they were better than in most other large towns and cities. There were no inhabited cellars. Nevertheless, excluding three or four principal streets, there was not one without courts on the right and left, where pure air could not possibly circulate; and in summer the inhabitants were seen coming to the main street to catch a breath of air. The practice of taking in lodgers led to overcrowding; the rooms were very small, and the habits, prejudices, and ignorance of the inhabitants rendered ventilation impossible. The uncleanliness of the poor was due rather to poverty than indifference. Scrubbing-brushes, towels, and soap were luxuries which the poor could not always afford. The fact that sitting, sleeping, cooking, washing, drying, and nursing had all to be done in one room accounted for much untidiness and much mismanagement and unthrift at home, and for habits of intemperance on the part of the husband, soon followed by the withdrawal of the children from school. Should the husband be taken ill, his wages ceased with his labour. Furniture, clothing, even bedding, then went to the pawnshop. Murmuring, strife, and violence followed. The house agent or rent collector then came with the bailiff to take anything that remained, and the wretched family, stripped of everything, might soon afterwards be traced to a low part of the town, occupying a dilapidated house, without an article of furniture—husband, wife, and children huddled together in a little straw on the floor. Refinement, sensibility, modesty, could not be expected to flourish in that atmosphere. The wife, perhaps, sank into an untimely grave, and was succeeded by an unmarried person. The children were driven from home by cruelty to lead a life, the chief events of which might be learned at the workhouse, the police court, and the gaol. He would be a sanitary enthusiast who should affirm that good drainage and ventilation, and interior structural arrangements, could have prevented these evils. He would be an educational fanatic who should maintain that compulsory education would render such a career impossible. He would be a religious bigot who could maintain that tracts and Bibles, Bible women, missionaries, and Scripture readers would have proved an antidote to the sanitary, social, and moral disadvantages to which the family were exposed. To no one of many causes could the downward career be traced of those who gravitated towards the lowest sub-stratum of society; and yet he knew little of human nature, and less of the temptations of the working man, who could hesitate to attribute the physical distress, social degradation, and moral ruin of multitudes in a great city to a combination of the influences described. The progress of improvement in the town was letting in light and air to quarters which had been the hotbeds of disease and crime; but the classes were not improved—they were merely displaced, to crowd localities which had hitherto enjoyed a more healthy reputation. To receive these persons long ranges and blocks of building had been put up, in the south-west, on the very boundary of the borough, between two great thoroughfares, dotted all along with villas and commodious shops and dwelling-houses. Drainage, water supply, and other sanitary wants, were unprovided for. Not less than 1,000 houses were erected within the borough of Birmingham annually—not a few for immediate sale—and the health and morals of the public were not items which entered into the calculation of profits. Houses let for immoral purposes constituted a better pecuniary speculation than any other, except public-houses. Hence, the man who consults public health and morals must sacrifice personal gain, and where personal gain was the sole motive, accommodation should be provided for drunkenness and prostitution. The labouring poor were utterly helpless to avoid localities where fever was chronic, and poverty and squalor indigenous, and where immorality saturated the social atmosphere. Even superior workmen could not always avoid these localities. Not able to build their own houses, they took them as provided by men who thought only of their own interests, and spent more upon an attractive exterior than upon substantial means of comfort. Houses were crowded together in blocks that defied light and ventilation; and almost every new street continued for months, sometimes for years, unpaved and undrained. Greater earnestness on the part of the authorities to interfere with what were assumed to be the rights of property, and more extended powers to insist on the observance of the approved principles of construction and of sanitary arrangements, would go far towards correcting some of the evils affecting Birmingham in common with all great seats of industry. There was a district on the confines of this borough where the water was intolerably bad, where fever had been domiciled, where the inhabitants were idle, squalid, and intemperate. Three consecutive rainy days reduced them to the greatest straits, and three weeks of snow to the pawnshop, the workhouse, and the cemetery.

The Industrial Progress of the Black Country

was treated of by Mr. J. C. Tildesley. Having traced the history of mining in South Staffordshire from remote times until the invention of the steam-engine by James Watt, Mr. Tildesley proceeded:—At the dawn of the present century the number of collieries in the district was 160, and the average yield of coal 500,000 tons per annum. In 1815 the collieries had increased to 200, and the annual yield to 800,000 tons. At present there are 540 collieries, yielding annually 10,206,000 tons, and employing 26,620 persons. This enormous supply is, however, in proportion to the number of collieries, lower than that of other English coalfields, owing partly to the intermixture of ironstone in the coal-beds of South Staffordshire, worked by the same shafts, and partly to the great number of small collieries, locally known as "Jackey Pits," worked on the old-fashioned whimsey principle. It is estimated by Mr. Hull that the ungotten coal in this district exceeds 950,000,000 tons, which, at the present state of working, will require 200 years to consume. The iron trade of South Staffordshire, from its commencement, in the reign of Edward VI., when blast furnaces were invented through its successive changes under the enterprise of Lord Dudley, Abraham Darby, Cort, and Foley, was next reviewed. In the year 1796 there were only 14 blast furnaces in the district. In 1806 the number had increased to 42, and in 1829 to 123. There are now 167 furnaces, of which only 80 are in operation. The present production of pig-iron in this district is 10,000 tons weekly, of which about one-half is made from native ores. It is, however, in the production of finished iron that South Staffordshire excels. There are in the district 102 forges, containing 2,100 puddling furnaces, and producing annually 855,000 tons of finished iron. It is estimated that the Black Country contributes half the entire production of finished iron in Great Britain. The district has, however, recently lost ground in the race of competition, the modern and improved scientific arrangement of the works in the Cleveland district and in Belgium having placed the South Staffordshire ironmasters, with their old-fashioned works and appliances, at some disadvantage. South Staffordshire will do well to confine its energies more to the quality than to the quantity or cheapness of its finished iron. There are in the aggregate 20,000 persons employed in the iron trade of the Black Country, the number being more than doubled since A.D. 1800; but there has been no increase during the past ten years. In the hardware produce of the district is exemplified to a remarkable degree the principle of the "location of trade." Every town and village has its own particular department of smallware, with which its neighbouring town, though haply divided only by a scoria mound and a couple of "swags," does not presume to interfere. In Elizabeth's time the district could boast craftsmen of considerable skill,—worthy descendants of Tubal Cain, "the inspired artificer in brass and iron." Some of the earlier crafts are now obsolete. Sword-hilts and chains, curiously carved, which would have done credit to Andrew Ferrara, were made two centuries ago at Wolverhampton. Silver buckles were made at Walsall until the invasion of "Wellingtons and Bluchers" revolutionized the livery of the country squires. Other branches, like the pottery trade of Wednesbury, have been transferred to other districts. The production of locks and keys at Wolverhampton and Willenhall has increased fourfold since the commencement of the century. The present weekly production of these articles exceeds 400,000, and the number of workpeople is 5,000. Chain-cable and anchor making around Dudley commenced in the year 1824. Over 60,000 tons of chains and 5,000 tons of anchors are annually produced by 4,500 workpeople. Saddlery and harness making has been the staple craft of Walsall from time immemorial. The rate of production has doubled since 1849. The aggregate number of workpeople, of whom a large proportion are females, is 4,200. Japanned and tin ware making in Wolverhampton and Bilston employs 2,000 workpeople, the number having increased by one-third during the last twenty years. Wrought nail making in East Worcestershire is, owing to the introduction of machine-made nails, a doomed and decaying industry. In 1830 the craft employed not less than 50,000 workpeople. Now there are only 20,000, and the number is fast decreasing. Glass-making is an important branch of local industry. There are three large plate-glass factories—two at Smethwick, and one at Stourbridge. The reduction of the duty in 1845 increased the production of glass-plate in England from 7,000 ft. to 140,000 ft. per week, a progress in which the Black Country has largely participated. The annual production of plate, sheet, and crown glass in this district is 17,000 tons, and the number of workpeople employed 2,500. There are also thirteen works in the neighbourhood of Stourbridge for the manufacture of flint and bottle-glass, employing 1,500 workpeople. The production of iron-foundry, boiler-plates, edge-tools, galvanised iron, tubes, railway and engineering work has increased during the last twenty years at rates varying from 50 to 70 per cent. The total number of workpeople engaged in the fabrication of hardware in the Black Country is estimated at 80,000, being an increase of 30,000 since the Great Exhibition of 1851. Foreign competition is severe. America excels by an extensive application of machinery; Germany, by the cheapness of labour. In facilities of production the Black Country is making little progress. The recent cuckoo-cry about "Technical education" was, so far as the art-workmen of this district were concerned, a false alarm. In the more intricate departments of hardware the Black Country workpeople are able, for ingenuity and chasteness of design and execution, to hold their own against all comers. It is only when a profusion of gaud and glitter is required for the palaces of imperialism that they can be at all outvied by French and German workmen. Our local artisans chiefly require their efforts to be supplemented by mechanical appliances, to reduce the mere drudgery of their toil, and leave them freer to exert their ingenuity in the higher and more inventive branches of handicraft. Mr. Tildesley, after referring to the improved social condition of the workpeople, concluded his paper by severely condemning the injustice of the Factory Acts in their present partial application to this district.

NEW PAINTED WINDOW IN THE PARLIAMENT HOUSE, EDINBURGH.

The only part of the old Parliament House in Edinburgh which escaped the destructive fire of 1824, which consumed the square in which the building was situated, as well as great part of the High-street, consists of a hall 122 ft. in length by 40 ft. in breadth. This apartment is used as an ambulatory in connexion with the Courts of Law, and is one of the objects of attraction in the northern metropolis. It is spanned by a heavy oak roof, having large gilt pendants, and is lighted on the west side and south end by elliptical arched windows fitted with Perpendicular tracery. Statues and busts of eminent judges and lawyers are ranged around the floor, which is of inlaid oak, and the walls are adorned with portraits.

The exterior of this edifice, which was erected in 1632, was a picturesque and richly-decorated example of Late Scottish architecture; but after the fire it was replaced by a classic façade entirely out of keeping with the interior as well as with the exterior surroundings.

The great south window, which is of five lights, was filled with a representation of Justice, surrounded by masses of murky clouds, and was, as a work of art, thoroughly contemptible. This glass has been replaced by an expensive specimen of the art of glass-painting from the celebrated manufactory at Munich, designed by Herr von Kaulbach, to whom drawings were furnished from the office of her Majesty's Works.

The upper part of the window is sub-divided in the usual Perpendicular manner, and is filled with armorial bearings, upon an enamelled groundwork of foliage, and the under part of each light has a square panel similarly treated. The great central part between these is occupied by a large painting, which stretches from side to side, without regard to the four mullions which intersect it, although the design has been adjusted, so that they interfere as little as possible with the composition.

The subject represented is the inauguration of the College of Justice, by James V., in 1532. In the centre of the picture the young king is seated on his throne, and in galleries to the right and left are the ladies of the court, while in front of the throne are grouped ecclesiastics, nobles, and judges in their robes of state. The moment chosen for representation is that when the president of the court has received from his sovereign the royal sign manual, and the archbishop is in the act of giving his benediction, while the spectators look on with intense interest. The whole picture has somewhat of a melodramatic effect, the action of the archbishop being particularly so, but, *as a picture*, the grouping is artistic and the drawing excellent. As a stained-glass window, however, it is not to our liking; the treatment is not architectonic, and it has none of the brilliancy and sparkle found in the best examples of the art. But even as a picture, it has the defect of having no middle tints. The figures in the galleries are about one-fourth the size of those in the foreground, and yet have the appearance of being close beside them. Indeed, we doubt if it is possible to overcome this defect in pictures of the kind, and it is one of the chief objections to this manner of treating subjects in glass. Much enamelling has been used in order to tone down the accessories, so as they may be subordinate to the main incident, but there are rich masses of colour in the robes of the principal figures. It appears to us that the result aimed at would have been more successfully attained in a mural painting. It is, however, the finest thing of the kind in this country that has come under our notice. Herr von Kaulbach has only used the drawings sent him as suggestions, and the whole design bears the impress of having been the work of a foreign artist. The window was fitted up under the superintendence of Mr. Charles Heath Wilson, of Glasgow, whose connexion with the windows in the cathedral in that city is well known to our readers; and that gentleman made the arrangements with the authorities at Munich for carrying out the design.

The cost has somewhat exceeded 2,000*l.*, which sum has been voted by Parliament on account of this service.

NEWS FROM ABROAD.

Berlin.—Those of our readers who have visited Berlin will remember the Brandenburg Gate. Its general character, the style, and the situation (at the end of the Linden and leading to the Park), all helped, in all probability, to remind him of the Arc de Triomphe at Paris, whilst the Quadriga on the top is further associated with that city as having been carried thither by the first Napoleon, but brought back and restored to its original position after the peace. To this gate colonnades are now being added, flanking it on either side. The designs are by Professor Strack, and the works will be finished before the winter. Forty-four designs have been received for the cathedral to be built here, and these will be publicly exhibited as soon as the Annual Autumn Exhibition of the Royal Prussian Academy is closed. The plans include several from English and French architects (two from Toulouse), and seventeen from Berlin.

The New Polytechnic School at Munich, for the building of which one million florins, about 85,000*l.*, were voted by the Bavarian Parliament some years ago, was to be formally opened on the 15th instant. It stands opposite to the well-known Pinakotheke.

In Vienna, as in London, the reform of the Patent Laws is being agitated. Whilst some are, of course, for the preservation of the existing laws, others are for mere registration; a third party is for the American and Prussian system (examination of patent claimed by a committee or council); whilst a fourth party would see the entire system abolished.

Cavaliere Cannio, professor of the fine arts at Florence, died in that city on the 3rd September last, at the age of 84. His best known work of art is the statue of Columbus on the Piazza dell' Acquaverde, at Genoa. "Villa Vermont," the house in which the Grand Duke Nicholas died at Nice, was bought by the Emperor of Russia immediately after his death, and was cleared away for the purpose of erecting a chapel upon the site. The chapel is in the Byzantine style, of polygonal shape in plan, and about 90 ft. high. A handsome portico of Carrara marble, surmounted by a fine mosaic from Rome, representing St. Nicholas, leads to the interior, which is lighted by ten round-arch windows, filled in with red glass and yellow rings. The walls are built of dark red stone, with banks of a paler tint, whilst the interior is lined with white marble. The centre of that part of the chapel to which the congregation are admitted, is occupied by a black marble slab, about 8 in. high, of the exact size, and on the exact site, of the bed on which the Grand Duke died. The rest of the floor is laid in mosaics, of various coloured marbles, and the walls around are further decorated with niches, containing twenty-four pictures of saints, with the background always in gold. The pomegranate trees which surrounded the house, have been removed, and turf and evergreen shrubs help to set off this very handsome little chapel. More frescoes have again been discovered at Pompeii. Two of these are remarkable as being the first discovered which were evidently intended as portraits. They are those of a man in the senatorial toga, and of a woman holding a pencil in one hand and tablets in the other.

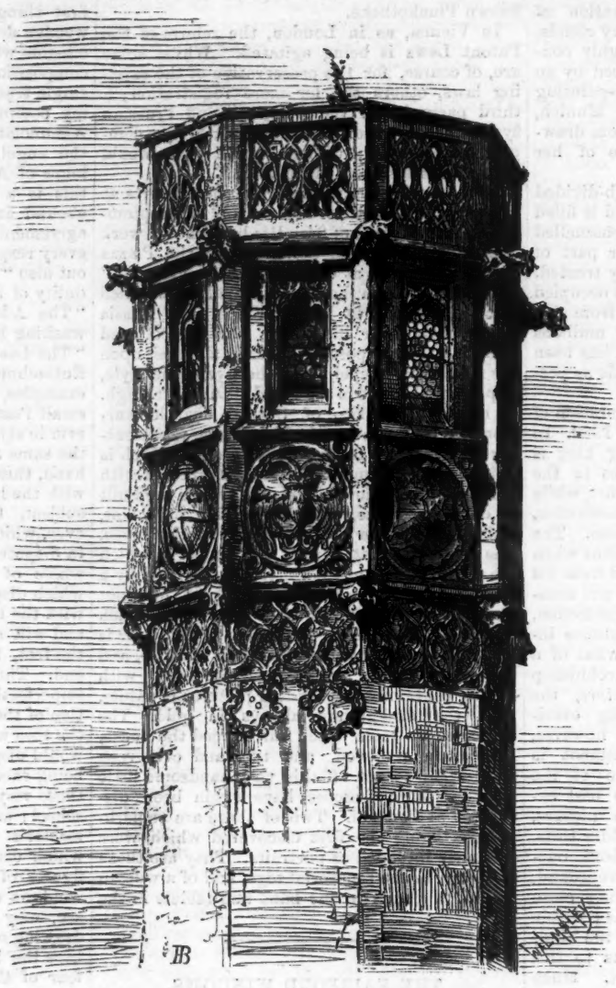
THE FAIRFORD WINDOWS.

Having recently visited Fairford Church, and put the windows to the test of an immediate comparison with the known works of Albert Dürer, I beg to submit to your readers the result; for it is only by such a test that the debated question can be decided. On entering the church and giving the subjects a superficial glance, I must confess to my disappointment on not detecting a single trace of the special style of Albert Dürer as known to us by his numerous engravings. I should have rejoiced to have been able to acknowledge that we had such a glorious treasure in England; but I had brought with me a number of the wood-engravings known as the "small Passion," works executed in the purest manner of the master, and I proceeded to compare them one with another. If I had had even a lingering doubt before, it would now have been dissipated. Over and over again did I make the comparison, with this inevitable conclusion, that if one was by Albert Dürer the other was not. But as general terms do not carry weight, I will proceed to analyse and compare the two, and will begin with the east window.

Now, had we only this remaining, it would have been impossible for any one, however blinded by his enthusiasm, to have ascribed it to that great man's hand. First, the subject of Christ entering into Jerusalem. The engraving shows us a simple, but beautiful, composition: the figure of Christ, in ample drapery, finely arranged, the hair falling in ringlets over the shoulders,—a very constant habit with the master,—the ass upon which he is riding well drawn after nature, and the whole composition free from ancient conventions. In the window the subject is treated according to early conventions: the figure is draped in a very simple manner, almost to poverty; the hair is lank and ungraceful, and the ass a very ill-drawn, wooden representation. "The Agony in the Garden" in the engraving is one of the most beautiful and touching of Albert Dürer's designs; indeed, I do not know of any master who has thrown more feeling into this subject. The window is utterly unlike it in character and treatment, and still more unlike the larger engraving on this subject. I pass by the other subjects of this window, as not calling for particular notice, to "The Crucifixion." Here the first thing to be noticed is the very bad and wooden drawing of the horses, utterly irreconcileable with anything of Albert Dürer, and the composition, from beginning to end, has not a single trace of the master's style. Carrying on my comparison, I take the subject of "The Annunciation," and will point out the figure of the angel as being especially unlike what we know of Albert Dürer: and here let me observe, this is a strong point, for figures of angels abound in his works, all having a general agreement in style, but totally differing in every respect from that in the window. I point out also "The Harrowing of Hell," "The Incredulity of St. Thomas," "Christ in the Garden," "The Adoration of the Shepherds," "Pilate washing his Hands," "The Supper at Emmaus," "The Last Supper," "The Resurrection," "The Entombment," and "The Pentecost," with other examples, to the number of twenty, of the small Passion, in which not a single trace whatever in style, composition, or costume agrees with the same subjects in the windows. On the other hand, these quite agree in all these particulars with the larger work of A. Dürer on the same subject. One of the most important facts, however, which ought at once to settle the question in dispute is the drawing of the nude. I take the whole of the figures, without any exception, which display anything of the nude, beginning with the large figure of Christ in the "Doom," and will also add the extremities, particularly the feet, in all the subjects from beginning to end. The figures are ill drawn, the anatomy imperfectly understood, especially the articulation of the joints; and the feet are large, ugly, the toes without form, and weak. This, of itself, would dispose of the question of these windows being executed from Albert Dürer's drawings, for these very points are characteristics of another school; and it would be an insult to the great master's memory to attribute to him works which contain these imperfections. The large figures of apostles and prophets which fill the windows of the two aisles, fine figures as they are, may also be criticised for weaknesses in drawing of the hands, though in general we have here the best work. But it is remarkable that four of these figures, side by side, are studied closely from the same model. I should lay no stress upon this point alone, but Albert Dürer is remarkable for his luxuriant variety, and I believe his judgment, as a great artist, would have taught him to avoid this monotony.

There is a fine and interesting set of figures in the north clearstory,—interesting, especially, on account of the rarity of the subject, viz., "The Persecutors of the Church." I challenge any one to produce a parallel from the works of Albert Dürer which assimilates to any one of them. They mark a distinct school, which school is manifest throughout the whole series of subjects. I now draw attention to the architectural details, especially to the canopies of the large figures. Here we should certainly expect to see a decidedly German type in works attributed to Albert Dürer; the more especially as he indulges in a very free use of the florid crocket-work that marks the school, whenever he deals with Pointed architecture. Now, there is nothing whatever of this, but the style is altogether that which marks the Flemish school, and it is to that school, so unmistakeably indicated in the general character of the work, that these windows belong. In the details of costume, the angular drapery, the faulty drawing of the nude, and the observance of ecclesiastical traditions, we recognise the early Flemish school, and had these works been assigned to any follower of the school of Van Eyck, the disproof would be exceedingly difficult.

Some, who have written upon this subject, appear to be entirely ignorant of that traditional mode of representation which was a law in ecclesiastical art. Thence they have ascribed to an individual the treatment of a subject that not only did not belong to him, but not even to his school, but which was generally obeyed by all the artists of the Middle Ages. The great artists of the sixteenth century broke from the trammels, in a more or less degree, and Albert Dürer among them. He rarely uses the *nimbus* in his compositions, and disregards, whenever it suits him, all conventional treatment. His luxuriant fancy made him impatient of restraint; thence he is the most picturesque of designers. He never repeats himself, but his style is so strongly defined, that there ought not to be a moment's question as to whether the Fairford windows should be or not attributed to his hand. Those



MEDIÆVAL DOMESTIC TOWER IN COLOGNE.

who will have it so, do it at their peril. They must credit Albert Dürer with imperfections which his known works never exhibit. Among the many details that have been appealed to to prove these works to be by A. Dürer are the scroll inscriptions and a monogram. As regards the first, we are told they exactly coincide with the alphabet called A. Dürer's. I plead to an ignorance of this special alphabet; but having had thirty years' experience of Mediæval alphabets, and possessing a collection of inscriptions from the thirteenth to the seventeenth century, I failed to see any speciality whatever beyond that perfectly familiar to me. As regards the last, I admit it was a very *great* discovery. It was not, indeed, our familiar friend A. D., but A. T. Nevertheless, with wondrous learning and research, we are told that Dürer was Thürer, and that he might spell his name with a T, just as the respected Weller, sen., spelt his name indifferently with a *wee*. How can we withstand such learning and research? Surely this ought to clench the whole affair, and loud praises of triumph ought to have been awarded the discoverer, only he had been beforehand with us, and sounded them himself. One trifling fact, however, is wanting, not perhaps important, but some people *will* cavil,—viz., that there is *no* A. T., but simple, modest, unpretending letter A. This letter is on the sword-blade of the executioner of St. John the Baptist, close against the hilt. It is, therefore, more likely to be a final than an initial letter; and as the colour is gone beneath it (a defect seen in many of these windows), it is probably only a part of some inscription. Of all places, it is the most unlikely one for an artist's monogram to be placed; for swords are often inscribed, and this may be merely the final letter of an appropriate legend, such as "IRA," or "LUXURIA," most likely the latter, in allusion to the immediate cause of the death of the saint. But whatever this may be, the only true signature of an artist's work is in itself. To appeal to petty details to decide the artist's hand when such abundant materials exist, savours somewhat of impertinence. And as to the traditions, one and all, let them be dismissed to the land of dreams whence they came, and to which they appropriately belong. In conclusion, I must state that, although the Fairford windows are not quite up to the standard of Albert Dürer's genius, they are, nevertheless, fine works of art, and their completeness is such as should make it a matter of national importance to insure their due preservation.

J. G. Waller.

DOMESTIC TOWER, COLOGNE.

In the Middle Ages, Cologne was celebrated for the number and beauty of its towers. So striking was the effect of this city that the Pope, Æneas Silvius, is said to have declared it to be the most striking in Christendom. And notwithstanding the destruction of more than fifty of its churches at the revolution, and modern "improvements," few cities have a more picturesque "sky-line." It is probable that originally most of the larger and more important houses (as well as the churches and public buildings) of this city were furnished with one or more towers. Eight or ten of these towers still exist in various parts of the town. They are all of a similar character, and consist of a lofty octagonal shaft, perfectly plain from the base to the height of the roof of the house, and crowned with a very elaborate top story and open parapet. The best examples are near St. Mauritius Church (of which we give a sketch), in the Neü Strasze, Neü Markt, and Jesuitten Gasse.

FROM MELBOURNE.

A stained-glass window has been ordered by the Rev. Mr. Parle for the chancel of St. Patrick's (R.C.) Church, Belfast, from Messrs. Ferguson, Urie, & Lyon, of Melbourne. The design for the four lower or principal openings consists of the Nativity, Baptism, Death, and Resurrection of our Saviour. In the large circular opening in the upper portion of the tracery the Ascension is the subject; and in the intermediate openings other scenes in the life of our Saviour are represented. The upper portion is complete, but temporary windows of plain cathedral glass will be inserted in the lower portions. The cost of the window when completed will be 280*l*.

Collingwood.—The new Foresters' Hall in Smith-street, Collingwood, has been opened with a *conversazione*, attended by about 200 of the members of the order and their friends. The ground cost 602*l*. 10*s*., and the building 2,500*l*. The whole work has been done at the cost of the Court Perseverance 2,727, a sum of 1,000*l*. having been appropriated from the court funds, and the remainder of the amount was borrowed on mortgage. Two shops form the front part of the premises. The architect of the building was Mr. F. H. Thomas, and the contractor Mr. Edward Galbraith. The gas-fittings were by Mr. Sitch, with whose patent reflectors the hall is lighted. An excellent piano, of colonial manufacture, has been supplied by Mr. Blazey, of Richmond. The hall, including a gallery at the west end, will seat about 400 persons.

Ballarat.—There is to be a public park for Ballarat East. The council having decided to ask for the reservation of Mount Xavier, a picturesque spot situated between the Melbourne-road and Eureka-street, this will be the site of the park if it be obtained.

THE NEW TOWN-HALL, MELBOURNE.—Messrs. Reed & Barnes, Architects.

THE NEW TOWN HALL, MELBOURNE.

The foundation-stone of this handsome structure was laid on the 29th of November, 1867, by his Royal Highness the Duke of Edinburgh. At about four o'clock his Royal Highness, accompanied by the Governor, Viscount Newry, and Lieutenant Haig, arrived in a carriage and four, with outriders and postilions, escorted by a great number of troops. In a second carriage were Miss Manners-Sutton, Miss M. Manners-Sutton, Mr. Brierley, and Mr. Manners-Sutton; and in a third were Lieutenant Rothwell and two younger sons of his excellency. His Royal Highness was received by the mayor, the aldermen, and councillors, at the threshold of the temporary building, and conducted to the council-chamber, thence to the platform, where the ceremony was performed. Messrs. Reed & Barnes are the architects; Messrs. Lawrence & Cain being the builders. The trowel used was of solid gold. The building is progressing rapidly, and when finished will be one of the principal features in Melbourne.

GLOUCESTER CATHEDRAL.

The restorations on the southern side of this cathedral are making progress, and the exterior of the south transept is complete, except a few finishing touches. The open parapet which had been removed from the sill of the great south window has been replaced, and a panelling beneath has been renewed. Below this a small niche has been discovered. As the back and sides are each painted with a black St. Andrew's cross on a red ground, it is probable it contained a figure of that saint, and this supports the opinion that the south transept was originally called St. Andrew's aisle. The window is temporarily closed, but will be filled with painted glass, the gift of Mr. T. Marling, of Stroud. The restoration of the south porch is the next work on hand. It had originally been intended to do this with Anston stone, the same as that used for the Houses of Parliament; but, after having been quarried some time, it was found difficult to work, and Bath stone is to be substituted. An addition has just been made to the painted glass in the cloisters. Over the lavatory are ten two-light windows, with traceried heads, one window at each end, and eight in front. These have just been filled with painted glass by Hardman, of Birmingham, the gift of Mr. G. Bonnor, of Kensington. Of course the subjects are all Scriptural, and include a representation of the miracle of turning water into wine, Christ walking on the sea, the miraculous draught of fishes, Christ washing the feet of his disciples, the division of the waters, Christ and the woman of Samaria at the well, the cure at the pool of Bethesda, Christ teaching from St. Peter's ship, &c.

THE NEW LONDON MEAT AND POULTRY MARKET.

Mr. H. Lowman Taylor, chairman of the Markets Improvement Committee, has brought up a report to the Court of Common Council of proceedings relative to the construction of the Metropolitan Meat and Poultry Market, and recommending that the Coal, Corn, and Finance Committee be authorised to negociate for a loan of 85,000*l.* to meet the necessary expenses in connexion therewith. Mr. Taylor said the court would remember that, as far back as December, 1865, authority was given to the committee to obtain estimates for the erection of the market upon designs which had been furnished by the architect. The committee wrote to a number of first-class builders, and the lowest tender received was from Messrs. Browne & Robinson, a very respectable firm, who agreed to do the work for 134,460*l.* The highest tender was from an equally respectable firm, Messrs. Ashby & Sons, and the sum they asked was 170,000*l.* Messrs. Browne & Robinson's offer was accepted, and the works were now being carried out by them in a way that would do credit to the corporation, and there was every reason to suppose that the market would very soon be completed. The architect's estimate of the cost of erecting the market was 200,820*l.* The works, however, would be carried out at something like 12,000*l.* or 13,000*l.* below that estimate. They had had authority from Parliament to raise 200,000*l.*, and they had raised that sum, but they should only spend 188,000*l.*, and it was thought advisable to reserve the balance to meet the interest on the loan of 200,000*l.*, already amounting to 5,888*l.*, and other incidental charges. The contract with Messrs. Browne & Robinson was signed on the 22nd of December, 1866, and at that time these gentlemen ought to have had possession of the site, but they did not get possession till some time afterwards, and the last portion was not given up to them until the 26th of March, 1868. They were thus put to great inconvenience, and could not complete their works within eighteen months as they had contracted; and as, in accordance with the provisions of the agreement, they could not be called upon to have the market ready for some considerable time, and as the committee were desirous of having the building finished as early as possible, they had come to an equitable arrangement with Messrs. Browne & Robinson to add the sum of 4,200*l.* to their contract, on condition of their completing the works, and giving possession of the market, by the 14th of November next, and also as some compensation for the increased expense incurred by them from the delay in obtaining the site. The court would see that it was a matter of pecuniary importance to have the market completed as soon as possible.

It was originally contemplated to have cast-iron columns and girders and brick piers; but it was subsequently considered advisable to have the whole of wrought-iron, and no amount of money could be thrown away in a matter of this sort to give strength to the building. To erect a market above a railway station was a thing unprecedented and not to be carried out without great care and consideration; and, as the architect and engineer recommended the alteration, the committee were most anxious to give effect to it. Anticipating the opening of the market in November, the committee thought the ceremony should take place in the most public manner possible; and they were anxious to obtain some person of considerable note to open the market, knowing that when the Cattle Market was opened they had the lamented Prince Consort, who kindly attended on that occasion. Therefore, if the court would leave this matter in the hands of the committee, they would bring up a recommendation which he believed would be acceptable to the members. The report also recommended that the committee should have authority for dismarketing Newgate Market. It was very gratifying that at the new market every shop and available space was disposed of and allotted; and they had been obliged to refuse further allotments. At each of the corners there was an elegant refreshment-house for the accommodation and convenience of people frequenting the market, and these also had been let, one at a rental of 470*l.* and the other three at 500*l.* each. The market revenue would be upwards of 40,000*l.* In conclusion, Mr. Taylor moved that the court agree with the committee in their report.

The report of the committee was agreed to.

WORCESTER GAOL ENLARGEMENT.

The works consequent on the amalgamation of the county and city prisons have been commenced, and will occupy twelve months in the completion. Mr. Rowe's estimate of the entire cost, including purchase of cottages and land in Easy-row, was 10,000*l.* The six cottages to be removed at the north-west angle of the row cost about 1,400*l.*, and Messrs. Wood & Sons' estimate for their portion of the new works was some 5,000*l.* in round numbers. To set against this expenditure, there is the sum received for the site of the old city gaol, so that the total outlay will be under 8,000*l.* The new works will be a continuation and extension of the north-west radiating wing of the old county gaol, and the new boundary wall will extend to the highway in Easy-row, in length enclosing the space occupied by the six cottages and their gardens. This wall will be of brick, and is to be 23 ft. high, having on its top two courses of loose brick, surmounted by a stone coping. At its north-west end will be an entrance doorway, under a pointed arch, of sufficient width and height to admit of the prison van being driven in and out, for the removal of prisoners without exposure to spectators. The space enclosed by this outer range of buildings forms a large airing ground, in the centre of which will be erected the new block of prisoners' cells. The new block will consist of a basement and three tiers of cells above, the cells being forty-eight in number. In the basement will be the warming and ventilating apparatus (by Haden, of Trowbridge), also baths, washing places, and store-rooms. The first tier of cells is approached from a central corridor, and the other two tiers by galleries; each cell to be separately supplied with water, gas, means of ventilation, water-closet, and all the other appliances, to correspond with the most modern arranged cells in the old building. The corridor of the new building, being in a straigh tline with that of the old, will be under the same inspection and control of the officers.

A NEW SYNAGOGUE, ROCHESTER.

The foundation stone of a new and handsome Jewish Synagogue, which is about to be built and endowed by Mr. Simon Magnus, merchant, Chatham, was laid by that gentleman on Monday, the 5th of October, at Rochester, Kent, in the presence of the mayor, and a large number of spectators. The building and house adjacent for the residence of the Rabbi form an extensive frontage in the High street. The site was purchased from the governors of St. Bartholomew's Hospital, for the sum of 1,500*l.* The new synagogue will be built from the drawings of Mr. H. H. Collins, under whose superintendance the buildings are now in course of construction by Mr. J. G. Naylor, builder, Rochester, and with the sum appropriated for endowment will cost 7,000*l.*, the whole of which will be defrayed by Mr. Magnus.

SEWAGE EXPERIMENTS IN ESSEX.

The report of the experiments with sewage irrigation made at the Lodge Farm, Barking, by the Metropolitan Sewage and Essex Reclamation Company, for the year ending on August 31, has been presented to the directors by the manager, the Hon. H. W. Petre.

He commences by stating that one-fourth of the Lodge Farm has been during the last two years devoted to the growing of Italian rye-grass. This has been attended with a somewhat less favourable result than last year, as regards the weight of the crop. Whilst, however, the area of grass cut this season was five acres less than last year, and the quantity of sewage applied to the whole farm up to the 20th June this season was 204,000 tons, producing 892 tons of grass, in addition to other produce, the 279,000 tons applied to grass alone last year yielded up to the same date 769 tons only. The value of sewage-grown grass is beginning to be appreciated, and the demand for it now exceeds the supply. In addition to feeding from fifty to sixty milking cows entirely on sewage-grown grass with most satisfactory results, two young steers had been fed exclusively on that grass from 18th May. On 7th August their respective live weights had risen from 7¾ cwt. to 9¼ cwt., and from 6 cwt. to 7¼ cwt. The results of some interesting and successful experiments with wheat, oats, rye, cabbage, and mangold are given in the report. Some experiments on a smaller scale are then given with canary seed, linseed, parsnips, potatoes, sugar-beet, red cabbage, onions, &c., and with great success in all cases, especially with cabbages. Perhaps the most satisfactory result is that with the mangold wurtzel, though quite expected, from the experience of the crop of last year on a smaller scale.

The report contains an account of the cultivation of the rest of the farm, consisting of about 100 acres. On this the only manure applied is salt and the sawdust litter used in the cow-houses and stables. Mr. Petre then institutes a comparison between the sewage and other manures. No amount of ordinary manure, he remarks, could produce six or seven crops of grass in a season, weighing from six to twelve tons each. In the case of mangold, also, the knowledge that two dressings or floodings of sewage, consisting of 200 or 300 tons per acre each, is capable of producing a crop of from 50 to 60 tons per acre, enables a comparison to be drawn with the ordinary crop of 20 to 25 tons produced with a good dressing of farmyard dung. The crop of wheat grown last year without any manure was about 3½ qrs. to the acre; this year the yield with sewage was 5½ qrs. The land is a poor gravel. In conclusion, Mr. Petre says:—"Although, per-

haps, a larger return might be obtained by cultivating only the most profitable crops, it must be remembered that this farm was established with a view of testing the real practical value of town sewage in ordinary agriculture and exhibiting the results, more especially to the farmers of South Essex, the company's future customers for the whole of the sewage of North London, not more than a 350th part of which is used on Lodge Farm in a year."

THE ARCHITECTURAL MUSEUM.

The Council announce the near completion of the premises in Bowling-street, Westminster, and are inviting the subscribers to call and inspect the new home for the collection about to be removed from South Kensington. Much has yet to be done, but they say that nearly the whole of the decorations have been promised by various workers in the architectural arts, who have generously come forward with offerings. It is proposed to open early in 1869. The fund subscribed is now exhausted, and 1,000*l.* more are required to pay the balance due to the contractor.

THE TRADES MOVEMENT.

The whole of the masons in Aberdeen have struck work on account of the masters refusing to continue payment at the rate of 5½*d.* per hour. Some time ago the masters, in agreeing to an advance on the then rate, did so on the ground that when the trade got dull the wages would be lowered. Now, when that arrangement was to be put in force, the men would not submit, and consequently struck work. Several masters agreed to the terms sought by the men, and it is believed the strike will not be of long duration.

The Congress of the German working men has taken place at Berlin. Dr. Schweitzer presided, and made a long speech in favour of establishing trade unions throughout the country. He is of opinion that strikes alone will not greatly improve the position of the working men, but that they are useful sometimes, and that the fear of strikes, when once vast combinations have made them dangerous to the masters, will often make the actual strike unnecessary. A violent quarrel arose at one of the meetings, which led to the secession of a large minority. Since then, the latter party has also been holding a series of meetings, and a great part of the time of the rival parties has been taken up with defending themselves and abusing each other. It, therefore, seems not improbable that the result will be the establishment of two opposition central associations, of which the one will adopt Schweitzer, and the other Schulze-Delisch, or at least his principles, for their guidance.

TESTIMONIAL TO A GOOD STEWARD.

Mr. Lewis Kennedy having been upwards of fifty years factor upon the estates of Perth, a desire was entertained by the tenantry to express their respect for him in his official capacity and as a private gentleman. That desire took action, and not long ago a meeting was held in Crieff, when the necessary arrangements were made to give the proposal a definite shape. In such cases there is usually a good deal of trouble connected with such a matter, but on this occasion the duties have been comparatively light. The proposal was entered into enthusiastically; the money came in in a stream; and in a marvellously short time the committee had the handsome sum of nearly 300*l.* at their disposal. It was decided that the sum collected should be expended in procuring three fine silver vases; and Mr. G. P. Kennedy, architect, Glasgow,—one of Mr. Kennedy's sons,—prepared by request of the committee of management appropriate designs, which were executed by Messrs. D. C. Rait & Sons, jewellers to the Queen, Glasgow. The presentation took place last week at Crieff.

The chairman of the meeting, in handing the vases to Mr. Kennedy, said, "Mr. Kennedy, some fifty-two years ago, came to this part of the country for the purpose of laying out the far-famed Drummond Gardens. These gardens are the pride of our parish, for they have gone far to make Crieff a favourite resort for health and pleasure-seekers; they have feasted the eyes of many a visitor, from many a country, and of all ranks, from our beloved Sovereign downwards. With regard to the tenants, Mr. Kennedy was always their true friend, ready to mix mercy with justice. He could not be expected to give the tenants all they wanted, but was ready to give them what was just. So far back as I can remember, in drinking his health on a rent-day, the remark was always made, 'He is a very honest man;' and we all know what Robert Burns says of such a man." Mr. G. P. Kennedy also came in afterwards for a share of praise.

LORD MAYOR'S SHOW.

A correspondent, "P. E. M.," writes,—

"Considering how very rarely we have anything like a public show or ceremony, I, for one, shall be very sorry for the time-honoured Lord Mayor's Show to lapse into desuetude. The innocent enjoyment of the common people ought, I think, to be considered by those in authority, a little. The great objection made to the usual procession is the stoppage of street traffic. But now that the Thames Embankment is open, affording accommodation for many thousands, why not reintroduce water processions, which would not be open to the objection named? Such might be made eminently showy and graceful, and interesting even to people of refined taste. I hope the Lord Mayor elect will look round on his architectural acquaintance, and see if he cannot find a worthy successor to Inigo Jones in the designing and getting up of a fitting and appropriate water pageant for the approaching Lord Mayor's Day, something which shall be had in remembrance in years to come. I hope the matter, Sir, will have the aid of your advocacy."

The retention of the show has always had the aid of our advocacy. The abandonment would be a matter for great regret. Some years ago, when Alderman, afterwards Sir John, Musgrove had been elected to fill the office, we published some suggestions for the improvement of the Show, which had a wide currency at the time. We hope Alderman James Lawrence will not aid in diminishing the ceremonial. It has its value even beyond affording amusement and matter of interest to many thousands of persons not too constantly supplied with it,—not a trifling thing itself.

SIR DAVID WILKIE'S LETTERS.

Sir,—My attention has been called to the *Builder* of August 15th, in which are published some letters from Sir David Wilkie to my father.

I beg leave to correct a statement which is not exact. The portrait was not "painted unknown to him."

I well remember going over many times with my father to Phillimore-place for the sittings, at which I was present. It was never quite completed, the hands not having been finished.

I have no doubt that the letters came into your possession in a legitimate manner; but some one, through whose hands they have passed, has obtained them surreptitiously.

The letter dated January 10, 1826, in particular, was not to be found, though anxiously sought for after my father's death, when I printed his "Autobiography," for private circulation. I thought it had undergone the fate of many valued papers, and had been used by the cook to light her fires. It seems it had a different fate. M. T. S. Raimbach.

THE ESSAYS ON THE TEMPORARY EMPLOYMENT OF OPERATIVES.

Sir,—Although I believe most people will agree that competition is the most efficacious way to bring out latent talent and encourage advancement by the offer of money,—that password by which man calls his fellow-creatures to his assistance,—yet I cannot but think that the benefit which may be derived from it is only felt when aided by the press.

Reading from time to time in the *Builder* your description and criticism on the merits and demerits of the various plans submitted in any important competition, I have observed how many you favour with your notice, although only one perhaps can gain a prize; thus extracting and bringing to light for the benefit of all whatever is meritorious and ingenious in the labours of those gentlemen who had devoted their time and thoughts in endeavouring to obtain excellence in what they had undertaken; and nothing, Sir, can be more certain than that your criticisms are most beneficial to those who compete, and are highly valued by all.

There has just been competition upon a most important subject at the Social Science Congress, viz., "Employment during Casual Distress." I understand nearly eighty competed, and circumstances lead me to believe that some of the papers were by men occupying such a social position that some bright thought or useful piece of information would be sure to be gleaned from them. But, as in a written paper only the one gaining the prize is made public, would it not be well to invite those gentlemen to publish together their papers, that no useful thought or calculation once conceived should be lost to the science of economy? And I must say I consider that the Government should become fully acquainted with every circumstance which could be brought to bear on the subject of unemployed labour, that they might take the initiative in whatever is done.

I understand that the competitors have had their papers returned, and therefore this course would not interfere with the rules of the association. R. F. D. C.

THE CONDITION OF BIRMINGHAM.

Sir,—My attention has been called to a statement made by Mr. Godwin in the Health Department of the Social Science Congress. The statement alluded to was to this effect: That aided by the police, he (Mr. Godwin) had visited a certain district, including certain streets mentioned by name, situated in the centre of Birmingham. The state of the district he thus sums up:—

"In more than three-fourths of the whole of the streets in the district he visited he found houses tumbling down, no floors, no windows; floors torn up, pavements retaining decaying matter, and of a character always to retain it; an utter want of closet accommodation. In Balloon-street he found back-to-back houses, the rooms full of people, and the middens all full. In No. 5 Court, Brick-kiln-street, the neighbouring cesspool of the court was some 3 ft. higher than the pavement of the court; and the consequence was that the filth was constantly oozing through, and spreading over the floor of the court. The first woman he inquired of in one of the courts had three children living, and she praised the locality as being very healthy. Then he elicited from her that she had five children dead. Next door the woman had no children dead, but her husband, she added, had been invalided for many months. In a court in Staniforth-street, an open cesspool was to be seen—that is, the closet ran into what was prepared to be a midden, but, being never so used, was simply filled with fœcal matter. Here, again, there was the same appearance on the part of the children—pale faces, sunken eyes, woman worn and haggard, and throughout the whole of the inquiry he did not meet with a single child who was able to read. Here, then, was what he begged leave to point out to the authorities of Birmingham—an enormous population, living under conditions utterly opposed to anything like health. Whether any attempts were made to remedy this he could not say, but, at any rate, they must have been very insufficient. He could go through a large number of similar cases, but he did not think it necessary. Here, in these wretched districts, were growing up, in ignorance and dirt, girls and boys, with no other prospect than the streets for the one and the gaol for the other. Where, he asked, had been the ministers of the Church? Where had been the clergy?"

As the above statement refers chiefly to my parish, in which the streets named are situated, I trust to your courtesy to allow me a word in reply. In the greater portion of Mr. Godwin's statements I most thoroughly agree. The state of Balloon-street, Brickkiln-street, Hen-street, and a portion of Staniforth-street is truly wretched, and many of the houses almost unfit for human habitation. But Mr. Godwin asks, "Where have been the ministers of the Church?" "Where have been the clergy?" I am afraid the poor clergy have sometimes rather a hard card to play. If they do not interfere, for instance, in sanitary matters,—more properly the business of the lay authorities,—they are brought to book. If they do interfere, they are going out of their province, and had far better confine themselves to spiritual matters, and leave all secular work (education, perhaps, included) to the laity. However, as I look upon education as an integral portion of a clergyman's work, and consider the preservation of its religious character indispensable, I will venture so far to inform Mr. Godwin that the educational necessities of the parish have not been overlooked. In addition to the ordinary school departments, there has been in

existence since 1861 a ragged school, twice enlarged to meet the exigencies of the case. There are four large principal school-rooms and five class-rooms, and there were present in the day and night schools, in July last, at H.M.'s Inspector's examination, 1,778 children. This is, of course, independent of the Sunday day and Sunday night schools; and I may further say, so strong is my sense of the deep need of that portion of my parish alluded to by Mr. Godwin, that having at length secured the old police station in Staniforth-street, the erection of a large new ragged and infant school will be commenced (D.V.) within ten days, although after troublesome begging, I still require over 700*l.* of the estimated sum for the purchase of the site and erection of the school. I may honestly say, I do not think, considering the wretched poverty of the parish, and the difficulty of obtaining money, more could have been done than has already been effected in an educational point of view.

I trust to be able to open the new school (D.V.) in the first week of January next.

With regard to the sanitary aspect: It has long been my wish to erect a row of model labourers' dwellings, and lodging-houses, both in the neighbourhood of Balloon-street, and also in Old Cross-street and Vauxhall-street. I have mentioned the matter frequently to several laymen in the town; but the great impediment—money—still stops the way. However, I do not despair. Of one thing I am satisfied, from a long service in poor parishes, that the generally wretched character of the dwellings of the poor, the absence of refining influences, and the miserable associations of poverty-stricken homes, courts, and streets, tend much to the inhumanising influence which, destroying the finer susceptibilities and blunting the better feelings of the heart, generally results in brutality and crime, a family plague, and a social curse. Of the incalculable injury to health and physical well-being it is, perhaps, not my province to speak.

May I also add, in reply to Mr. Godwin's question, "Where are the clergy?" one word on their behalf. The statistics of the educational blue-book will abundantly show that, in spite of many difficulties, the clergy have steadily pushed forward in the great educational work of the country. Conscious of its necessity, they have spared neither labour, anxiety, nor money in its prosecution, and they alone who have been engaged in the work can form any adequate conception of the difficulties which attend it. I am sure Mr. Godwin, when the facts of the case come under his notice, will kindly withdraw the reflection he has hastily cast upon me, and believe not only of me, but of my brethren the clergy of Birmingham, that we are, one and all, most anxious and earnest in our efforts to provide a good, sound, and cheap education for the working classes of the town.

J. Hart Burges, D.D.,
Vicar of Bishop Ryder's.

CONCRETE BUILDING.

Sir,—In the *Builder*, page 699, *ante*, a notice is given of certain patented improvements in concrete building; and, in justice to the building public, as well as to the patentees, I am desirous of pointing out that in each of the sections described as "first," "secondly," "fourthly," and "lastly," there is no novelty, nor anything that has not been in use previously to the date of the patent. Therefore, it is useless to attempt to claim a patent for them. From July to December, 1867, being at the time manager to Mr. Tall, I made a great many specimens of concrete, to show to persons interested in the matter what it was possible to do in concrete building. Some of these specimens had the fine concrete face cast on; some had the triangular and other shaped recesses; and some the ornament in relief. Several of the specimens were exhibited at the Architectural Association, December 6, 1867, and are mentioned in a printed paper. The casting of concrete cornices, caps, string-courses, cills, &c., in place, is notoriously old. As the son of a builder who was very partial to the use of concrete floors, skirtings and hearths, chimney-pieces, and cills, they are among my first recollections. Indented string-courses were designed by Mr. T. Hayter Lewis for some cottages now building at Staplehurst; and string-courses, cornices, &c., indented and in relief, were designed by Mr. G. Woodhouse, architect, of Bolton, for a large school now building with my patent apparatus. The use of T-iron for concrete chamber floors and roofs is also old.

As to section "thirdly," there is nothing in the notice to enable me to judge of its merits. However, if the patentees will take the trouble to make inquiries, they will find that my statement as to the other sections is accurate.

Chas. Drake.

Sir,—I beg to bring to your notice the partial (I am afraid it will turn out to be total), destruction of a large house building in the above material, at St. Margaret's, Twickenham (see *Builder*, 19th September last, page 699). The walls, 12 in. thick, have been carried up to a height of about 35 ft. The whole of the front wall of one wing from top to bottom, with all its window and door frames, and a portion of the side wall, have fallen down, and are now a heap of ruins, with dangerous cracks in other portions of the building. There has been much talk lately about this kind of work, and I trust that the cause of this failure in a material of which we were beginning to have some faith, will be fully explained.

Will Watch.

Sir,—I write you a few facts respecting my block concrete system. I have erected at West Bank, New Hampton, Middlesex, a pair of houses. I claim,—first, my walls are totally free from moisture; secondly, my blocks will stand the fire, which may be seen of the house that has been burnt out at Northfleet, leaving all the walls and chimneys now standing which I built some time ago; thirdly, I will guarantee to build and complete a pair of houses, that is to say, if all my blocks be ready before I begin laying them, with two layers, and complete the whole thus:—Build all walls, slating, plastering, stoves, coppers, fit for habitation within one month with ease. In my block system the wal's contain nothing but gravel and cement, showing in blocks on the face of the work the natural material itself, saving the cost of and requiring no plastering ever afterwards. Some have said that the block system is as dear as brickwork. I differ in opinion, as the following item will prove to you of one day's practical test:—

Thus, in casting my blocks of September 12th,—

	£	s.	d.
One man preparing gravel	0	3	6
Two men making blocks	0	7	0
One man laying down moulds ready to fill up	0	3	6
One cast of Robins's Portland cement	0	7	6
Total cost	£1	1	6

Number of blocks made, 424 in nine hours, being equal in bulk to 3,392 stock bricks. Compare the cost for bricks and my blocks, which proves its economy to you at once. I am using Robins & Company's Portland cement for making my blocks, and I advise your readers, if they think of employing concrete, to use it. First, you can depend on its durability; secondly, it will set like a mass of rock in a very short time.

W. May, jun.

GLAZING.

Sir,—I have an iron skylight glazed with glass, 1 in. thick, 68 in. by 28 in., the squares of which are all broken by the contraction and expansion of the metal. They were bedded in putty, and the skylight had an iron capping fitting on the rebates, but not touching the glass, the space between being filled up with putty. I should be obliged if some of your readers who have experience in the matter, would suggest a plan by which the breakage may be prevented. Would a thin layer of wood or cork prevent the damage?

E. P.

WASH THE HOUSES.

Sir,—You have frequently drawn attention in your columns to the neglect of sanitary matters by the St. Pancras authorities, and you should let your readers know that during the late hot weather, a suggestion made in your columns, viz., washing the exterior of the houses in the many courts and alleys, by means of stand-posts with a hose attached, was carried out. In the East, or Somers-town district, alone, fifty-six confined and densely populated courts have been repeatedly flushed, much to the comfort of the poor inhabitants, and amongst the number—

A Working Man.

LIABILITY OF SUB-CONTRACTORS FOR WAGES.

At Worship-street Police-court, Messrs. Browne & Robinson, builders, of Worship-street, were summoned by James Vesch, a bricklayer, for the sum of 1*l.* 13s., wages due for work and labour done for them. The complainant stated that he was engaged by a man named Elliot, who was pointed out to him as being the foreman of some works being carried on in St. John-street-road, Clerkenwell, and to whom he had applied for work, as a bricklayer, at 8d. an hour, to help to run up a brick wall. On Saturday, the 19th, there was owing to him 1*l.* 17s. 6d., of which he received 1*l.* from Elliot, who stated that he could not pay him more, as the firm (Browne & Robinson) had not sent him enough money. He went to Messrs. Browne & Robinson, and was informed that Elliot was a sub-contractor, and therefore liable.

In answer, it was contended that the contractors were not liable, inasmuch as they had underlet their contract for this particular work to Mr. Joseph Elliot, who had failed to carry on the work, and had overdrawn his accounts. A stamped agreement between Elliot and Browne was handed up to the magistrate.

Joseph Elliot, builder, Merton, Surrey, was produced, and he swore to the agreement. As a sub-contractor he had engaged the complainant, gave him directions, and set him to work. He was not able to pay the men on the 26th, as Messrs. Browne had only sent him 10*l.* with which to pay 20*l.*

Mr. Newton said that being so he had no course left but to dismiss the summons.

PAINTING HOT-WATER PIPES.

Sir,—Some few months ago I read in the *Builder* (I think), of a material for colouring or painting iron stoves and hot-water pipes, that would stand the heat, and would not throw off the disagreeable effluvium arising from ordinary oil paint, Brunswick black, or Japan varnish. It was, if I recollect rightly, composed of *water-glass*, mixed with lamp black, or other colouring matter. Can any of your correspondents inform me what the materials are, how and in what proportions they should be used, and where they are to be obtained?

A Subscriber.

RESPIRATION.

According to the most reliable experiments, a man makes sixteen respirations per minute, and he draws into and expels from his lungs 30·51 cubic inches of air at each respiration, consequently the quantity of air that he respires per minute is equal to 488·16 cubic inches. The expired air contains 4·6 per cent. of carbonic acid; and, as the atmosphere consists of one-fifth by volume of oxygen, four-fifths of nitrogen, and ·04 per cent. of carbonic acid, the quantity of the different gases that a man inhales and exhales per minute, is exhibited in the following table:—

A Man inhales per Minute		A Man exhales per Minute	
Gases.	Cubic Inches.	Gases.	Cubic Inches.
Oxygen	97·5920	Oxygen	77·1952
Nitrogen	390·3728	Nitrogen	390·3728
Carbonic acid	0·1952	Carbonic acid	20·5920
	488·1600		488·1600

John Phillips.

PROVINCIAL NEWS.

Kettering.—The contract for the erection of a new banking-house and manager's residence for the National Provincial Banking Company, to be built on the site of the late Three Crows Hotel, in Granby-street and Horsehair-street, from a design and plans by Messrs. Mellican & Smith, of this town, architects, has been taken by Messrs. Osborne, Brothers, masons, &c., of Leicester. The style of architecture adopted is a mixture of Classic and Elizabethan.

CHURCH-BUILDING NEWS.

Churchill.—A new church, built on the site of the old parish church of Churchill, has been consecrated by the Bishop of Worcester, and opened for divine worship. Mr. W. J. Hopkins prepared the plans, and the work has been executed by Mr. Warner, of Malvern. The edifice is in the Early Decorated style, and is built of dark red sandstone, obtained from a quarry on Lord Lyttelton's estate. It consists of chancel, nave, and tower, to the latter of which it is hoped at some period to add a spire. There are traceried windows to the chancel and nave, and on the one side they are of varying sizes. The chancel roof is panelled, and the nave has an open-timbered roof. There are sittings for about 120 persons in the church. The cost is 1,800*l.* The length of the church is 73 ft., and the breadth 22 ft.

Hednesford.—A new church has been consecrated here. The building is of stone. It is in the Early English style, is plain, in parts almost to baldness; but the design is only partially carried out, provision being made for a tower at the west end, and the pillars and arches for a north aisle have been built and enclosed with a thin wall, which, on the addition being made at any future time, may be readily removed. The chancel has a semicircular termination. There is a south transept for the children, and the building will seat 500 persons. The inside of the walls as well as the outside is of smoothed

stone. The cost of the structure (exclusive of the site, which is given by the Marquis of Anglesea) will be about 3,000*l*. The architect was Mr. W. Rushworth, of London; and the builder Mr. M. Anderson, of Cannock.

Boughton.—The new church and the addition to the graveyard have been consecrated by the Bishop of Lincoln. The new church is built of Steetly stone, with ashlar of Ancaster stone. The interior is faced with red brick, banded at intervals with stone and black bricks. The style of architecture is Early Geometrical. The builder was Mr. Hopkinson, of Retford. The church will seat 200. The architect was Mr. Fowler, of Louth.

Hyde.—St. Thomas's Church, Hyde, has been consecrated by the Bishop of Chester. It is very simple, both in general arrangement of plan and in details. There is accommodation for 600 people, on the ground-floor and in a small west-end gallery, for the sum of about 2,300*l*. The walls are built and faced with rubble stone of the place, pointed on the outside. The coigns, cornices, strings, and more ornamental parts are of red stock-bricks, the colour of which contrasts with that of the rubble walling. A little ashlar stone is used where constructionally needed. The principal entrance is through the west door. There is a wooden porch, the inner doors of which open into the central passage of the nave. The nave is 72 ft. by 43 ft., divided into five bays by timber-framed principals: it is 40 ft. high. The chancel is 26 ft. by 20 ft., and not quite as high as the nave. The north chancel aisle opens by wide arches into chancel and nave, and will contain the organ. The western bay of the nave is galleried. The gallery-stairs are on the south, and the font on the north side of the west porch. The seats are low open benches. The chancel has longitudinal stall-like benches. The glass is arranged in different forms and devices. The east window has a floral ornament and a little colour. The whole of the walls are covered with a warm tint. The windows, arches, &c., are also brought out in different tints from that of the wall. The east wall of the chancel is decorated in colours and gold, by Mr. R. Park, in devices designed by the architects. The belfry, which surmounts the west gable, is of moulded brick and stone. The bell, cast by Mears, has the motto "*Cum voco venite.*" The churchyard is surrounded with a wall of brick and stone. The builders were Messrs. J. Robinson, of Hyde; and the architects Messrs. J. Medland Taylor & Henry Taylor, of Manchester.

Cornforth (*Durham*).—A new church, dedicated to the Holy Trinity, has been consecrated at Cornforth, near Durham. The edifice is built from plans by Mr. Pritchett, of Darlington, the estimated cost being about 2,000*l*. It holds about 300 persons.

Manchester.—The additions to St. Oswald's Church comprise a tower and spire, which has just been completed. The tower is divided into four stages, with buttresses at each angle, with canopied heads. The tower is faced with Yorkshire parpoints with ashlar dressings. The spire is of dressed ashlar with gurgoyles at the springing of broaches, with ornate lucarnes, and relieved with bands of Runcorn stone, terminated with gilt vane, rising to the height of 150 ft. The outlay is 1,300*l*. Messrs. Ellis & Hinchcliffe, of Manchester, were the contractors, and Mr. J. Lowe, Manchester, the architect.

Patricroft (*Manchester*).—Christ Church, patricroft, has been consecrated. It is in the Early English style, and comprises nave, 82 ft. by 30 ft., with north and south aisles; chancel, 30 ft. by 20 ft., with stalls for the choir, with vestry and organ-chamber adjoining. The chancel is laid with encaustic tiles. The principal entrances are at the west end. The nave has an arcade of six arches of moulded bricks of varied colours, with pillars of Mansfield stone and carved caps of Bath stone, which support the lofty clearstory. The roof has open-framed principals of high pitch. The west elevation is pierced with a large circular window, and from the gable springs a lofty belfry, terminated with a gilt cross. The pulpit is of Caen stone at the north-west angle of nave. The font is near the west entrance. All the seats are open stained and varnished. The church is faced externally with Yorkshire masonry, relieved with bands, &c., of different colours. Accommodation is provided for 600 persons, of which 318 are free. The works have been executed by Mr. Southern, of Salford, at an outlay of 3,900*l*., under the direction of Mr. J. Lowe, architect, Manchester.

Exeter.—The Church of St. Michael and All Angels, which has been erected at a cost of 20,000*l*., and is the gift of Mr. W. Gibbs, of Tynteefield, Somerset, formerly of Mamhead, has been opened. In addition to this gift, and an endowment of 80*l*. a year, Mr. Gibbs has built a school-room, near the Church of St. Michael's, for the boys of the parish, and also a vicarage-house; he has also built a chapel of ease at Cowley Bridge. The new edifice is in the Gothic style of the Early period. It will accommodate 650. The east window cost 650*l*. The organ cost 800*l*. The church is built of Westleigh stone, with Hamhill dressings. The spire overtops everything of the sort in the city or neighbourhood; the entire height is 233 ft. It is a pretty close imitation in style of the spire of Salisbury Cathedral. It has a bell weighing over a ton.

Bedale.—Several improvements have recently been made in the interior of Crakehall Church. It was formerly, in many respects, one of the most mean and squalid churches in the diocese. The chancel and sacrarium are laid with encaustic tiles, and the latter guarded by a rail. There are a new prayer-desk and pulpit, lectern, and choir seats. The woodwork is light and open, and has been well carved by Mr. C. Palliser, of Northallerton. The lectern and communion rails are by Jones & Willis, of Birmingham. The altar furniture, hangings, &c., are by Browne, of Manchester. The architect employed was Mr. G. F. Jones, of York.

Norton.—The foundation-stone of the new chapel about to be erected in the parish cemetery at Norton has been laid. The plot of ground secured is 6½ acres in extent, and cost 2,000*l*. It is situated on an elevation in Derbyshire-lane. It is intended to consecrate only about two acres at present. Messrs. Flockton & Abbott, of Sheffield, are the architects of the chapel, and the builder is Mr. John Camm, of Norton. The chapel, which will be Gothic in style, is to be built of stone from the neighbourhood, faced with Burbage and Grenoside stone. It will be 30 yards by 20 inside.

Bewdley.—The church of St. Leonard, Ribbesford, has been re-opened after some considerable repairs and partial restoration. It is well known to archæologists as presenting an open arcade of timber work in pillars and arches in the nave; but several discoveries have been made: for instance, the flat framing stones in the lintels of two windows (having been denuded like the rest of the building of a coating of rough cast and whitewash, and restored to the original pale crimson of red sandstone), prove to be carved in an original pattern; the door of the rood-turret, marked by a buttress, and its newel staircase, the base of the rood-loft, and two niches in the east wall of the south aisle have been found. The latter are deeply recessed: one probably held the death-light for the cemetery, like one in a somewhat similar position at Ashford: the other may have been used for a similar purpose. It retains red colouring in distemper powdered with crayons of five points, like those worn by saints in Mediæval illuminations, and on one side a fragment of the upper lid of a diminutive coffin of the fourteenth century date, with the words "Ben Henri," in Lombardic letters, and a flowing ornament, has been built into the south jamb. The trefoiled waterdrain of the lady chapel, at the east end of the north aisle, has been laid open, and, like the two canopied niches, supporting like corbels, the wall plate of the roof coloured in distemper. Several texts of the early part of the seventeenth century have been retouched. The pulpit has been lowered, the "three-decker" replaced by an open reading-stall. The whitewashed ceiling has given place to open woodwork. The sanctuary has been lined with old carved oak, and the Jacobean credence-table is once more, after long disuse, placed on the north side. The "horse boxes" and "pens" in the nave are abolished, and additional room obtained for the congregation. Mr. Baker, of Kidderminster, was the architect employed. The Rev. Mackenzie Walcott (cousin of the rector) is, we are informed, the gentleman to whom the restoration is due.

Hanford (*Staffordshire*).—The old church at Hanford has been reopened for divine service. The old edifice having for some time been in a dilapidated condition, and quite inadequate to accommodate the increasing congregation, was pulled down last year, with the exception of the chancel, which had been rebuilt and enlarged. The rest of the church has now been entirely rebuilt, and the number of sittings increased from 200 to 480. Its plan comprises a nave 67 ft. by 21 ft. 4 in.; north aisle 67 ft. by 8 ft. 8 in.; south aisle, 61 ft. by 8 ft. 8 in.; a south porch, a gallery at the western end of the nave capable of holding seventy children, a vestry to the north side of the chancel, and a bell-turret at the north-west corner of the south aisle. The nave is of five bays, and has a clearstory. The whole of the building is of the most simple character. The walls are of plain red bricks, faced with the same, both externally and internally, stone-work only being employed very sparingly, as a frame for the glazing of the windows. The constructive timbers of the roofs are all exposed to view internally, and the ceilings are formed between the rafters. The arcades of the nave have cylindrical piers with stone caps and bases very plainly moulded, and blue brick shafts. These bricks are made for the purpose and set in cement. The arches are of brick, chamfered on the outer edges, and have keystones. The passages in the floor are paved with Minton & Co.'s plain square tiles, and the spaces where the benches are placed are boarded. The glazing throughout is fixed in lead lights, in varied patterns, and is of crown glass, slightly relieved by the introduction of green-tinted patterns. The nave is fitted with new open benches, and the aisles with the benches of the former church. The gallery has new seats for children, and the chancel new stalls for the choir. The pulpit has been refixed on the south side of the nave, and the prayer-desk on the north side, and a new lectern has been provided. The font is the gift of the architect, and is constructed of blue and red bricks put together with cement, the bowl being lined with lead. The amount of the contract was 900*l*., exclusive of the benches, gasfittings, and heating apparatus. Mr. Alfred Barlow, of Stoke, was the builder; and Mr. Charles Lynam, also of Stoke, the architect employed.

DISSENTING CHURCH-BUILDING NEWS.

Derby.—The memorial stone of the United Presbyterian Church at Derby has been laid. The building occupies a site at the junction of Green-lane and Gower-street. The plan is arranged to accommodate about 500, with minister's vestry and session-room, heating chambers, and other offices in the rear of the church. The style of architecture adopted is English Gothic of the thirteenth century, and the material for the walling externally is white Coxbench stone, the window tracery being of fine Hollington stone. The principal front towards Green-lane has a high pitched gable, containing a five-light window, with tracery geometrical in design, and is flanked on either side by the entrance porches. The doorways to these have moulded arches supported on shafts, with moulded caps and bases. Between the centre gable and the north porch an ornamental spirette rises to a height of 70 ft. The front next Gower-street is divided into five bays, the easternmost bay projecting as a transept, and containing a two-light traceried window. Each bay in the body of the church contains a couplet of cusped-headed lancet windows. Internally the church is divided into nave and side aisles by two rows of light iron columns supporting the arched ribs of the roof. The ceiling of the roof is divided into panels by timber ribs, stained and varnished. The contract for the building has been taken by Messrs. T. & H. Herbert, of Leicester, at the sum of 2,150*l*., and the works are being proceeded with. The architect is Mr. J. Tait, of Leicester.

Bristol.—The chapel which has been erected by members of the Baptist persuasion, just beyond the site of the old White Ladies' turnpike, has been dedicated to public worship. The building is from the plans of the late Mr. S. Hancorn, of Bristol and Newport, architect. The design is in the Decorated style of Gothic, and includes the chapel, with transepts; vestibule, with two lobbies; open porch; chancel, with baptistery underneath, and organ recess on one side of the same; minister's and deacons' vestries and private entrance; ladies' vestry, with private entrance. An end gallery is erected over the vestibule and lobbies, with stone staircases. A tower is included in the design, but it has as yet only been carried high enough to receive the stairway therein. The chapel is lighted with five three and two light traceried windows, of cathedral glass, in two tints. The walls of the chapel, internally, are stuccoed, and the elevations are faced with Pennant stone in random

ranged courses, tuck pointed. The floors of the vestibules and lobbies are paved with encaustic tiles. The chapel is heated and ventilated by Messrs. Haden, of Trowbridge. The work has been done by Messrs. Marquis & Munroe, general contractors; Mr. Tuckey, plumber; Mr. Gay, glazier; Mr. Leman, smith and gasfitter; Mr. Rice, staining and varnishing; Mr. Margetson, stone carving; and Mr. Houghton, wood carving. The expense incurred has been about 7,500*l.*

Books Received.

A Manual of Practical Assaying. By JOHN MITCHELL, F.C.S. Third Edition: Edited by WILLIAM CROOKES, F.R.S., &c. London: Longmans, Green, & Co. 1868.

THE first edition of this almost standard work was extensively sold, and a second edition followed. The rapid progress of science soon renders a metallurgical work antiquated, and it therefore became necessary to rewrite some parts of the work and modify others. This has been done by a highly competent and able editor, Mr. Crookes, who in this third edition has incorporated all the late important discoveries in assaying made in this country and abroad. Most of the chapters are entirely rewritten. The old equivalents, however, are retained, as they are more generally understood by students of science who do not make chemistry their chief study. Special care has been devoted to the blowpipe assays, as well as to the important volumetric and colorimetric assays; but the chapter on crystallography is left out altogether, as a subject only remotely bearing on assaying. The work may well be said to be far better than ever it was.

Miscellanea.

OLD PAVING.—A contract has been entered into with the city of Paris to buy up all the old-paving stones for the purpose of shipping them across the Atlantic, where they are to be used to pave the principal thoroughfares of Buenos Ayres and Monte Video.

FATAL FALL FROM A HEIGHT.—A labourer, of Bradford, employed at Heaton, in a stone quarry, was engaged wheeling a loaded barrow along a plank, which spanned a deep chasm of the delph, when he lost his presence of mind, became dizzy, and fell off the plank, the barrow falling on one side and he on the other. He alighted on his head, which was fractured, the depth of his fall being 24 ft., and was killed on the spot. The coroner's jury gave a verdict of "Accidental death."

COMPLETION OF THE GREAT RAILWAY BRIDGE ACROSS THE MERSEY.—The deviation line from Ditton, in Lancashire, to Dutton, in Cheshire, on the London and North-Western system, is seven miles and a half long, and has been in course of construction since 1863. In this length is included the stupendous iron girder bridge across the river Mersey at Runcorn. It consists of three spans of 305 ft. each, besides four arches, which rise out of the bed of the river on the Lancashire side. The bottom of the bridge is 75 ft. above high-water mark, and in order to attain this elevation, which was necessary to keep unimpeded the navigation of the river, viaducts have had to be erected on both sides, and in these are no less than ninety-four aches. The whole line has cost 250,000*l.* Messrs. Cochrane, Grove, & Co., of Dudley, are the sub-contractors for the bridge, under Messrs. Brassey & Ogilvie, who accepted the contract for the whole line. A footway runs alongside the bridge, supported on cantilevers, and this has been opened so that the many inconveniences of the old ferry are done away with. The line itself will, it is expected, be opened for traffic early in December. It will save between nine and ten miles in the journey between Liverpool and London, which it is intended to accomplish in a little over four hours. The carriages for this special service will be built somewhat upon the American principle, for which we have so long contended while urging communication between guards and passengers, through a passage up the centre, and they will be provided with retiring-rooms for passengers. Arrangements, we are informed, will also be made for the supply of refreshments during the journey.

LIVERPOOL ARCHITECTURAL SOCIETY. — The members of this society held their first sessional meeting of the year at the Royal Institution, Colquit-street, on Wednesday night, the 7th inst. The opening address was delivered by Mr. Francis Horner, the president, who referred to some of the most important questions occupying public attention in reference to science and the fine arts.

THE TIMBER TRADE. — Messrs. Barnes & Sons' circular says:—"Our market continues to improve in tone, and there is not that entire stagnation we had to report a few months since. The importation compared with the corresponding month last year is 6,074 tons register less, and for the year to this date 6,681 tons less. This deficiency is on the following descriptions, viz., Quebec about 4,000 tons, St. John's and New Brunswick 6,800 tons. But the increase on Baltic goods and United States timber is sufficient to reduce the total falling off in importation for the year to 6,681 tons. Canadian woods: The demand for pine timber is dull. Baltic goods: There is a good supply of Memel timber, but the stock of Swedish is light. Pitch pine timber, &c.: The stock is large, the demand continues dull. Mahogany: the supply is equal to the demand."

TELEGRAPHS IN THE SUBWAYS AND SEWERS.—At the last meeting of the Metropolitan Board of Works it was stated that, in reply to a communication from the Postmaster-General with reference to the Board's subways and sewers being used for receiving the wires of the Post-office telegraphs proposed to be constructed, the Works Committee submitted a letter stating that it would afford them great pleasure to assist the Postmaster-General in any way, and with that view had prepared a plan of the Board's subways and sewers. Mr. Collinson moved that the letter be approved. He considered that it would be a great convenience to have the telegraph wires in the subways, as it would greatly facilitate the transmission of messages to and from the Fire Brigade stations, and would get rid of the telegraph wires with which London was now disfigured. The motion was unanimously carried.

THE TENDERING SYSTEM.—At a recent meeting of the Metropolitan Board of Works reference was made to the proceedings of contractors. At the previous meeting of the Board tenders were opened for the construction of a sewer in the Belvedere-road, Lambeth, and one of them being lower by 20,000*l.* than some of the other tenders sent in, it was accepted, subject to the usual inquiries. The surveyor now reported that the gentleman whose tender had been accepted at the previous meeting had since withdrawn. The next lowest tender was that of Mr. Pearson, which amounted to 26,900*l.* A lively discussion took place respecting the contracts of the Board, in the course of which the conduct of the contractor who sent in a tender 20,000*l.* less than one of the others, and afterwards withdrew without explanation, was remarked upon. The result of the discussion was the formal approval and acceptance of Mr. T. Pearson's tender.

THE NEW NORTH STAFFORDSHIRE INFIRMARY.—This building, which has been erected at Hartshill, near Stoke-on-Trent, and the foundation-stone of which was laid by the Prince of Wales, in June, 1866, was informally opened on the 6th inst. The total cost of the new infirmary, including site, &c., is 33,704*l.*, and towards this sum 23,951*l.* have been already obtained, and there are assets estimated at 5,573*l.*, leaving a deficit of 4,180*l.* The removal of the infirmary has been caused by the deterioration of the present building through undermining, and the injurious effects of ironworks and ironstone calcination in the immediate vicinity upon the patients, rather than by the want of a larger establishment, although more room was required, and has been for a long time. It has been built, at a cost of 27,000*l.*, by Mr. Alfred Barlow, of Stoke-on-Trent, from the combined designs of Mr. C. Lynam, of Stoke-on-Trent, and Mr. Nicholls, of West Bromwich. The pavilion principle is adopted by the architects, and the main building will afford room for 167 beds, 1,500 cubic feet of air being allowed for each patient in the ordinary wards, and 1,875 cubic feet in the "special case" wards, and in the fever hospital, which forms a detached block. Another separate building is an asylum for incurables, founded by Mr. Smith Child, at a cost of 1,000*l.*

ARCHITECTURAL ASSOCIATION. — The opening *conversazione* will be held at the House in Conduit-street, on Friday evening, the 30th inst.

NEW TOWN-HALL, MANCHESTER. — The first stone of the proposed new building is to be laid by the mayor, Mr. Robert Neill, on Monday, the 26th inst.

NATIONAL EXHIBITION OF WORKS OF ART AT LEEDS.—The visitors during the week ending Saturday, the 10th day of October, numbered, by season tickets, 5,296; by payment, 21,563, making a total of 26,859. Very little time now remains for those who would visit this important collection of works of art.

OPEN SPACES IN LONDON.—Mr. J. Runts, a member of the Metropolitan Board for the Hackney district, stated last week, at the meeting of the Hackney district board, that the committee of the central board, to whom the matter of the preservation of open spaces in and around London had been referred, had prepared a scheme for the enclosure of Blackheath, and were giving every attention to the general subject. He counselled the committee of the Hackney district board, to whom had been referred the question of the preservation of Londonfields, Hackney Downs, Hackney Common, &c., to arrive at some early conclusion as to the course they would wish to be adopted, and then to press upon the Metropolitan Board the bringing in of a scheme founded thereon. The committee, it was stated, would shortly commence active steps with this view.

THE SHEFFIELD WATER SUPPLY. — Extensive operations are being carried on in the neighbourhood of Bradfield, where four great reservoirs are in various stages of completion. The reservoirs are the Agden, the Strines, the Dale Dyke, and the Dam Flask, all made on the streams which converge in the Loxley, and all constructed on the principle of blocking up a valley by a great embankment. The Agden is on the point of completion. At Strines, it is expected that the works will be completed in a year or eighteen months. At Dale Dyke a great chasm has been dug in search of suitable foundation for the erection of a new embankment, in place of that which gave way on the 12th of March, 1864. The Dam Flask works can hardly be said to have commenced. The whole of these works have to be completed by the year 1873.

THE NEW VIADUCT ON THE MIDLAND EXTENSION TO BARNSLEY.—The new viaduct at Barnsley crosses the valley of the Dearne. At the lowest part, where the new line from Cudworth to Barnsley crosses the turnpike, the viaduct is 1,087 ft. long. It is composed of three stone piers—one 40 ft., one 41 ft., and another 10 ft. long, which form the end supports of the girders. The space from one abutment to another is supported by fourteen iron piers, which are bolted together, and, although light in appearance, seem to form a safe and firm structure. The contract for the masonry work was taken in March, 1864, by Messrs. Nicholson & Son, of Leeds. The iron-work has been executed by Messrs. Butler & Pitt, of Stamunley, near Leeds. Mr. John Sidney, of Crossley, is the engineer to the line, which is nearly finished, with the exception of the station. The work has, it is estimated, cost over 30,000*l.*

THE GAS QUESTION AND THE METROPOLITAN BOARD OF WORKS.—Messrs. Newton & Richardson have given notice of motion, "That in the opinion of the Board it is expedient that the manufacture of gas should, as far as practicable, be removed from the populous districts of the metropolis; that the Board should promote a Bill, empowering them to supply gas to the metropolis; that if it be desirable to take the existing gas companies, they should be compensated, the terms of such compensation to be, if possible, agreed on between the Board and the companies; and that the matter be referred to the Special Gas Committee, with authority to obtain the needful advice and take the necessary steps for the preparation of Parliamentary notices and of a Bill to be introduced into Parliament during the next Session; these powers, however, not to be sought if the companies will agree on such a price and such regulations as to the supply of gas as shall be satisfactory to Parliament." Mr. Evans gave notice that he would move as an amendment, "That in the opinion of the Board it is not advisable to take measures to promote a Bill in relation to gas supply during the ensuing Session of Parliament."

The Meyrick Collection of Armour and Arms.—This unique collection, we are happy to hear, is being brought from Goodrich Court to the South Kensington Museum, as a loan. It will be set up, we believe, in the gallery adjoining the Horticultural Gardens, which lately contained the Portrait Exhibition.

New Letter-stamping Machine.—Mr. Pearson Hill, a son of Sir A. Rowland Hill, has invented a machine for facilitating the stamping of letters in post-offices. It is self-inking, and impresses the two requisite stamps at once, to obliterate the postage-stamp and give the time and place of stamping. As many as 218 letters have been single stamped, and 180 double stamped, by help of this machine, in one minute, test time.

Proposed Botanical Gardens for Plymouth. A scheme is in progress for the establishment of Botanical Gardens for the three towns—Plymouth, Devonport, and Stonehouse,—similar to those at Bath and other large places. A piece of ground, planted with trees, situated between Argyll and Collingwood Villas, Stoke, has been selected. Most of the land in the vicinity of Plymouth being intended for building purposes, could not be obtained without giving the building lot prices, and Stonehouse was so confined that there was no available place to be found there. The Steward of the Lord of the Manor of Devonport has met the views of the committee. The cost of fencing the ground is roughly estimated to be 200*l*. The committee would erect a building with wood, having a slated roof and glass sides, which would cost 400*l*. With cost of planting, &c., 1,200*l*. to start with would be required. A committee has been chosen to further inquire into the matter.

New Mode of Ventilating Mines. — The Incorporated Association of Mine Agents of South Staffordshire recently made an excursion to Homer Hill Colliery, near Cradley, in order to inspect and test one of Guibal's new patent fans for ventilating mines. The fan is 16 ft. 8 in. diameter, 5 ft. wide, enclosed in a brickwork casing, and connected to the top of the upcast shaft by a tunnel of 35½ square feet sectional area. It is driven by a small ten-horse power high-pressure horizontal engine, connected with the winding-engine boilers, and the whole, when once started, requires little or no attention for days together. The air is drawn from the mine up the upcast shaft, and driven by the fan up a short chimney, much wider at the top than the base. Near the bottom of this chimney is fixed a sort of Venetian shutter, for the purpose of regulating the quantity of air. At an experimental trial, by the engine making sixty-five strokes per minute, the fan changed 37,500 cubic feet of air per minute. When at its greatest speed it was scarcely possible for the party to stand upon their feet. It was clearly shown that it only took about twenty seconds to increase the ventilation from a state of stagnation to that of 50,000 cubic feet per minute. The total cost of engine and fan complete has been about 500*l*.

The Proposed New Building for the Bradford Mechanics' Institute and School of Art. At a meeting of the committee of the Institute, the designs for the new building, prepared by Messrs. Andrews, Son, & Pepper, of Bradford, architects, have been finally approved, and instructions given to them to proceed with the necessary works forthwith. The advantages of the proposed edifice over the present will chiefly consist in a larger lecture-hall, in the number and size of the class-rooms, and the addition of galleries for exhibiting drawings, casts, and other works of art. The site is bounded on three sides by main thoroughfares. The principal front being towards the Bowling-green, and the flanks to New Market and Tyrrel streets, each of these fronts will have a spacious entrance and staircases. On the first, or principal floor, below which will be shops, will be the reading and news room and library, about 85 ft. by 40 ft., in the rear of which will be placed the lecture-hall. This room, about 80 ft. by 50 ft., and 30 ft. high, will, with its galleries, comfortably seat upwards of 1,000 persons, and extends through the first and second floors. The front part of the second floor will be occupied by the principal class-rooms, and the whole of the third floor, which is concealed by the parapet, will consist of class-rooms and the galleries before mentioned, all lighted from the roof. The style of the building will be modern Italian. The cost will be 12,000*l*.

The Proposed Aquarium at Brighton.—The Brighton Town Council have sanctioned plans for a large salt-water aquarium at Brighton, and have agreed to contribute 7,000*l*. towards the cost of a projecting sea wall that is to be built.

Henley-on-Thames.—Mr. Ferrey, having been called in by the churchwardens of the parish church of Henley-on-Thames to report upon the damage done by lightning to the building during the storm of the 20th ult., reports that beyond the destruction of the south-east turret and injuries to the roofing, &c., caused by the fall of the stonework, the tower has sustained no other fracture or settlement, and that the necessary reparations can be made at a comparatively moderate outlay. Such was the force of the lightning that it scattered the stonework far and wide, some fragments falling on the roof of the Red Lion Hotel, and portions even, it is said, into the Thames.

The Metropolitan Cattle Markets Bill. The report of the Markets Committee, with reference to the proceedings in Parliament in relation to this Bill, has been again brought up for consideration in the Court of Common Council. The committee recommended that they should be authorised to inquire into the whole subject, and report to the court the best course to be pursued in order to meet the requirements of the cattle and meat trades, and prevent, as far as might be practicable, the re-introduction of the cattle plague, and, whilst protecting the fair and proper interests of the corporation, to promote the advantage of the public. The committee also asked for authority to confer upon the subject with her Majesty's Government, and such other parties as they might consider advisable. The adoption of the report was finally agreed to in the face of an amendment to the contrary.

Furnaces for Smelting Glass. — An improvement in the method of creating draughts in glass furnaces has been patented by Mr. James Davison, of Bishop Wearmouth. At present, long caves are placed under glass furnaces, and large cones of brickwork above them, in order to get the sufficient amount of heat requisite for the perfect fusion of the materials used in glass-making. Mr. Davison's invention does away with these expensive and inconvenient draught creators. He employs steam, which is generated in any suitable boiler, and which is injected into small flues, chimneys, or funnels, by steam-pipes or jets. In each flue or chimney the steam pipes or jets may be either fixed or portable; they are provided with stop-cocks, so as to regulate the supply of steam, and in this manner a draught is created and the heat of the furnace increased and regulated at pleasure. The flues may also be so arranged as to consume the smoke from the fuel.

TENDERS.

For new wing to the Norfolk County Asylum, near Norwich. Mr. R. M. Phipson, F.S.A., architect:—

Nightingale	£4,689 0 0
Sabberton	4,180 0 0
Nelson	4,062 11 0
Balls	3,988 0 0
Gibbons	3,946 0 0
Newell	3,922 5 0
Downing & Hood	3,649 0 0
Youngs	3,595 0 0

For drainage works at Horley, for the Local Board, Reigate. Mr. J. F. Matthews, architect:—

For Materials and Labour.

Symonds	£925 0 0
Woodman	900 0 0
Ayers	746 17 0
Pitt (accepted)	745 0 0

For Labour only.

Woodman	£400 0 0
Edwards	415 0 0
Collips	192 10 0

For tavern at Southend, for The Commonwealth Land, Building, and Investment Society. Mr. Iron, architect:—

Johnston	£1,485 0 0
Gunn	1,475 0 0
Larke	1,410 0 0
Wood	1,363 0 0
Killby	1,335 0 0
Hearle	1,325 0 0
Crabb & Vaughan	1,289 0 0
Wicks, Bangs, & Co.	1,250 0 0
A. & J. Smith	1,247 0 0
Hobern	1,235 0 0

For alterations Nos. 27 & 28, Oxford-street. Mr. S. C. Capes, architect:—

Mann	£626 0 0
Manley & Rogers	607 0 0
Kelly, Brothers	588 0 0
Scrivener & White	559 0 0

For rebuilding the Bramley Arms, Notting-hill, for Mr. J. Empson. Mr. Alfred Stoner, jun., architect. Quantities supplied:—

Bishop, Ashford, & Co.	£1,587 10 0
Patrick	1,490 0 0
Gammon & Sons	1,398 0 0
Axford	1,330 0 0
Wheeler	1,300 0 0
Langmead & Way (accepted)	1,250 0 0

For building two ale stores at the Ramsgate Brewery, for Messrs. Tomson & Wotton. Mr. B. Adkins, architect:—

Goodchild	£1,977 0 0
Crickett	1,663 0 0
Belsey	1,638 0 0
Wilson	1,498 0 0
Epps	1,195 0 0
Sollitt (accepted)	1,187 0 0

For a villa residence, London-road, Enfield, for Mr. T. F. Clunie. Mr. F. Cushing, architect:—

Holbard	£978 0 0
Patman	944 0 0
Bayes	930 0 0
Brown & Son	880 0 0
Fairhead	870 0 0

For a dwelling-house, Sidney-road, Enfield, for Mr. S. Rutland. Mr. F. Cushing, architect:—

Bayes (accepted)	£285 0 0

For three cottages, Medcalf-road, Enfield, for Mr. Turner. Mr. F. Cushing, architect:—

Bayes	£398 0 0
Ranson	342 10 0
Holbard	315 0 0

For four cottages, Putney-road, Enfield, for Mr. Brown. Mr. F. Cushing, architect:—

Ranson	£300 0 0
Holbard	500 0 0

For parsonage-house, St. Mary Cray, Kent:—

Hollins	£1,875 0 0
Hill, Clayton, & Hobbs	1,779 8 0
Wright	1,745 0 0
Keys	1,700 0 0
Vaughan	1,400 0 0
Francis (accepted)	1,375 0 0
Smyth	1,125 0 0

For church restoration, Barrow-upon-Soar. Messrs. Stevens & Robinson, architects. Quantities supplied:—

	Tower.	Transept.
Fast	£436 12 0	£1,129 9 3
Elliott	378 7 0	1,105 19 10
Moss	480 0 0	950 0 0
Firn	404 0 0	970 0 0
Roberts	319 18 10	853 16 0

For alterations to 32, Gough-street, Gray's-inn-road (beer-house), for Mr. Tomkins. Mr. C. F. Crapp, architect:—

Terry	£599 0 0
Langmead & Way	547 0 0
Hughes	540 0 0
Cohen	484 0 0
King	379 0 0

For the erection and completion of a villa residence in Wiltshire-road, Angell-town, Brixton, for Mr. Thomas Shaw. Mr. Charles Bowes, architect:—

Lathey, Brothers (accepted)	£545 0 0

For building new school and master's house, St. Saviour's Church, Herne Hill-road, Brixton. Mr. W. Trickett, architect. Quantities supplied by Messrs. Batstone & Hunt:—

Lathey, Brothers (accepted)	£1,493 0 0

For finishing two villa residences, West-hill, Sydenham. Mr. William Mundy, architect.—

Webb	£1,735 0 0
Langmead	1,390 0 0
Larke (accepted)	1,347 0 0

For alterations to two houses in Old-street and Red Cow-yard. For Mr. William Smith, architect:—

Nash	£745 0 0
Cole	730 0 0
Mann	620 0 0
Shurmer	594 0 0
Clark	584 0 0
Fletcher & Caughey	500 0 0
Goodman	497 17 0
Staines & Sons	488 0 0
Crabb & Vaughan	469 10 0
Blackmore & Morley	450 0 0
Waters (accepted)	445 0 0

For the erection of a stable in the Seven Sisters'-road. Mr. William Smith, architect:—

Bradley	£537 0 0
Fletcher & Caughey	499 0 0
Crabb & Vaugham	409 0 0
Brisley	344 13 0

For residence at Chertsey, for Mr. J. Madocks. Mr. T. Wonnacott, architect:—

Britton & May	£2,208 0 0
Forster	2,116 0 0
Duke	2,109 0 0
Knight & Sons	2,081 0 0
Simpson	1,950 0 0
Marden	1,894 0 0
Harris	1,837 0 0
Turner	1,787 0 0
Nightingale (accepted)	1,777 0 0

For House at Wood-green. Mr. F. A. Klein, architect:—

		Deduction.
Bayes	£2,987 0 0	£336 0 0
Axford	2,955 0 0	315 0 0
Charlton	2,809 0 0	309 0 0
Nightingale	2,777 0 0	270 0 0
Perkins	2,644 0 0	309 0 0
Goodman	2,590 0 0	295 0 0
Dann	2,570 0 0	313 0 0
Carter	2,570 0 0	270 0 0
King	2,487 0 0	300 0 0
Cooke	2,243 0 0	290 0 0
Baker	2,190 0 0	260 0 0